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THE CONSERVATIVE TREATMENT OF LACHRYMAL OBSTRUCTION.

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However perfect the eyes may be in other respects, comfortable vision cannot be enjoyed if the tears are retained in the conjunctival sac. The frequency of annoyance from lachrymal retention I believe is underestimated. We are too prone to think only of the large group of patients who suffer from epiphora consequent upon a more or less complete obstruction of the drainage system throughout its course or at some point in the canaliculi, sac, or nasal duct; or of the more pronounced cases of acute or chronic blenorrhœ. There is, however, a very large number of people who suffer more or less constant annoyance from a partial retention of the tears which rarely or never amounts to stillicidium, but which nevertheless keeps up a conjunctival hyperæmia from the constant soaking in tears. The retention may be so slight, or may have come on so gradually, as not to have fixed the attention of the patient, who will come simply for relief from discomfort in using the eyes. My first lesson in this group of patients was learned now many years ago by the case of a medical friend, who came because of his inability to read with comfort, particularly in the evenings. His glasses were carefully adjusted, but without affording relief. There was slight catarrhal conjunctivitis, and too red caruncles, which persisted in spite of washes and various applications. He made no complaint of epiphora and there were no indications of trouble in that direction until one blustering day he came hurriedly from his professional rounds, and I witnessed for the first time his eyes suffused with the retained tears. The puncta were then recognized as extremely minute. These were at once dilated with a fine conical probe, the point of a syringe introduced and a warm solution of boracic acid thrown freely through the duct. A second treatment relieved him permanently of the annoyance which for months I had vainly striven to remove. Attention once called to these cases of concealed retention I was surprised at the frequency of their occurrence, and the readiness with which relief can often be given. The cause, however, is by no means always to be found in the contraction of the lachrymal punctum but perhaps quite as frequently in some irritation in the nostrils leading to a turgid condition of tissues in and around the nasal end of the duct. The study and treatment of these minor cases of lachrymal retention, led to some interesting observations regarding the punctum lachrymarum. In the attempt to dilate it I noticed that the probe was grasped as by a sphincter muscle. I suggested to my friend Dr. B. A. Randall, who was at that time associated with me in practice, that a careful anatomical study should be made of the part. Material was procured and the existence of a triangularly arranged series of muscular fibres were without difficulty demonstrated, a drawing and microscopical sections of which I here present. In cases where simple dilatation of this sphincter punctæ lachrymarum does not suffice the fibres should be nicked by means of the blunt pointed Weber knife, in the direction of the canaliculus. The fine tip of a syringe can then be inserted without difficulty, and many cases of a more serious type of disease than the one above described can be treated by this means alone, the duct being treated by syringing with a variety of solutions instead of by probing and syringing combined.

By these experiences I was convinced that a more conservative treatment of disease of the lachrymal passages than I had before employed was sufficient in a large number of cases. It was possible to thoroughly cleanse the lachrymal sac and to inject any desired application for the relief of the inflammation of its walls, through the dilated or enlarged punctum, without slitting the canaliculus.

It is not intended by this to imply that all cases of lachrymal obstruction can be treated successfully without the use of probes, but that simply I have by this means been able to relieve a certain number of cases which it had been my practice to treat by the method of Bowman. This experience has, however, had the additional effect of introducing a more conservative management of even the severer forms of lachrymal disease. It is probable that we have been too prone to draw analogies between closure of the lachrymal passages and urethral strictures, and have in consequence adopted the same theoretical considerations as a basis of treatment. The peculiar anatomical arrangement of the canaliculi and their relation to the common duct by which the tears are conveyed into the lachrymal sac, should not be thoughtlessly disturbed by slitting the canal up to its orifice at the sac. I do not think this can be done without in a measure disturbing the physiological function of this admirable apparatus. At no time should the incision be carried further than the beginning of the common duct. This will suffice for the insertion of any probe which it is wise to pass through the bony duct, except in comparatively rare instances where the duct is much larger than the average as found in the dried skull.

In those cases where probing the duct is needful, the disease has usually been of long standing and has resulted in a more or less uniform thickening of the lining membrane, which has either partially or com-

pletely occluded its lumen. The same patient will frequently exhibit great variation in the degree of occlusion. During acute exacerbations the closure is complete and the sac will be distended by the accumulated tears, mucus, dust, etc., which is swept into it from the eye, or by the secretions from its own walls, while at other times the tears find their way into the nose with difficulty through a much narrowed duct.

The surgeon will usually be consulted for the first time when the annoyance is exaggerated by the acute conditions fastened upon a chronic trouble. The passage of the probe at such times is often necessary, and always a temptation to the surgeon, but when done should be undertaken with caution, since the inflamed mucous membrane lining the irregular bony walls of the duct is not only tender but is liable to fold in front of the probe and be perforated or torn, an accident which invariably retards the progress, makes the patient worse and complicates the subsequent treatment. I have again and again seen permanent injury result from this accident. Under these circumstances if the probe does not pass with the exercise of mild force I have desisted from any violence and for a few days treated the sac by syringing, paid careful attention to any trouble in the nostril, and if reaction was marked, applied hot water compresses to the side of the nose and over the sac. When the acute stage has subsided the probing is again attempted. A few drops of a 4 per cent. solution of cocaine thrown into the sac, after thorough cleansing, will not only relieve the pain from the probing but by contracting the turgid tissues permit its readier passage. It has been my habit to pass a probe sufficiently large to fit closely and allow it to remain for half an hour. After a few minutes a "throbbing" sensation in the region of the duct comes on which later disappears. The probe should then be withdrawn, and the duct thoroughly washed with a warm saturated solution of boracic acid, or Dobell's solution, and this followed by some astringent. I employ a solution of silver nitrate gr. j., f3i, or a light wine-colored solution of iodine. This can be prepared by a drop or two of tinct. of iodine, or Lugol's solution in a half ounce of distilled water. Weak solutions of tannin are often useful.

In acute blenorrhœa of the sac, if seen early, hot water compresses are directed and if possible the sac flooded with corrosive sublimate solution $\frac{1}{8000}$, or what is often better, by solutions of blue pyoktannin. If the swelling is great and suppuration evident, the sac is opened in the usual manner and washed with the sublimate solution or pyoktannin through the incision, and hot water compresses continued. As soon as the swelling subsides the canaliculus is opened and the probe passed into the nose. The incision on the face rapidly closes and the closure of the duct which usually precedes the acute blennorrhœa treated in the manner above described. By these means I think it is possible to avoid the painful and I believe often injurious treatment by incision or by passing large probes with the idea of stretching or rupturing strictures of the duct. While by these means immediately good results are marked the closure recurs in a worse form than before. I have in a few cases seen narrow paper like strictures in which such treatment was indicated. In only one case have I ever felt justified in incising a stricture. In that instance it was a thin elastic membrane at the bottom of the sac. I long ago pointed out that the proper office of the probe is to place the thickened membrane under pressure for the time between the probe and the bony walls of the duct, and by this means hasten the absorption of inflammation products, much as the thickened edges of an old ulcer of the leg were removed by strapping.

The conservative management here urged, finds added force when we consider the etiology of this troublesome and frequent affection. Sudden onset of inflammation leading to obstruction of a hitherto healthy duct and sac has in my experience been rare. Inquiry will usually elicit the fact that the acute blenorrhœa is usually fastened upon a long standing case of more or less complete obstruction. Our task therefore is to discover the cause of the chronic disease.

I recall one case which may be regarded as an exception to this rule. A man in middle life came for relief from epiphora. The closure seemed quite complete, the parts were inflamed, and any attempt to pass the probe was extremely painful, and aggravated his trouble. Inquiry about his health discovered a syphilitic node on his scalp which had been incised by a physician who had mistaken it for an abscess. He had had the initial lesion several years before, had a syphilitic child, and his wife had had two miscarriages. All active local treatment for his lachrymal trouble was omitted and the mixed internal treatment prescribed under which he made a rapid and complete recovery from the lachrymal disease.

A frequent cause of the affections of the duct is to be found in the nose. I have often surmised that certain deformities of the bony duct may be associated with the frequent deformities of the bones of the nose. In a few instances this has seemed almost a certainty, but I have not had opportunity to demonstrate it upon any anatomical preparation. A very cursory study of any series of skulls, however, reveals great variety in the size and form of the duct. It is certain that in a considerable percentage of cases the lachrymal disease does not improve until attention is paid to the nostrils. I recall the case of a gentleman in middle life, suffering from epiphora, whom I treated in 1879. He was a large muscular man, in good health. Bowman's probes of medium size passed with but little difficulty through the duct. There seemed no reason why his epiphora should exist. Incidentally he called my attention to some trouble with the corresponding nostril which he hoped could be relieved. I discovered a broad superficial ulcer on the floor of the nostril, which spread itself around the orifice of the lachrymal duct, and over the anterior end of the inferior turbinated. This rapidly healed under a few applications of silver nitrate and the epiphora disappeared. Since then the nostrils have been subjected to inspection in all cases of lachrymal trouble. The frequency of the association of epiphora with various forms of nasal trouble will, I am sure, surprise the surgeon who has not investigated it as a routine matter.

It is by no means sure, however, that in all cases of such association that the lachrymal disease is an extention upwards of the inflammation in the nostril. While this I think is unquestionably true in some cases, as has been demonstrated by Dr. Harrison Allen, and in my own practice many times, and quite recently by Dr. Geo. E. de Schweinitz in a most instructive group of cases presented to the Philadel-

phia County Medical Society, it is altogether probable that in certain other cases the trouble in the nostril is secondary, being caused by the absence of the tears, which serve the purpose of cleansing, and keeping the parts moist. It is folly to probe a lachrymal duct day after day, so long as its lower end opens into the infectious accumulations of a diseased nostril without at the same time giving proper attention to the existing nasal affection. The lachrymal diseases of childhood are ordinarily of this class.

In a still larger group of patients the lachrymal retention is apparently due to a persistent hyperæmia and turgidity of the mucous membrane, common alike to the conjunctiva, caruncles and lachrymal apparatus. In these cases but little is to be gained by any method of treatment directed to the drainage system alone. It will be found that this condition is another link in the chain of symptoms produced by eye strain, just as blepharitis ciliaris is due to the same cause, as was pointed out by Roosa in 1876.

In some collated, but not yet published statistics, I have shown that in 86 per cent. of all cases of blepharitis it had been found necessary to correct some existing error of refraction or muscular balance. In my paper on incipient cataract, read before the Section last year, I pointed out the large percentage of epiphora associated with the inflammatory conditions of the internal tunics of the eye. In a word, this hyperæmia of the external tunics, including the lachrymal apparatus, is often but the outward expression of intra-ocular conditions. The refraction errors and muscular anomalies are the most frequent cause of the turgid choroidal and retinal circulation. It is in this large group of patients that we find lachrymal retention so common. Given the tortuous uneven walls of the average nasal duct, line it with an engorged mucous membrane, and it is easy to mistake a bony prominence in the duct, for a stricture, especially when it is encountered at the end of a lachrymal probe. This is particularly true where we are led to anticipate the existence of a stricture because of the retained tears. We have here all the conditions for the establishment of a so-called vicious circle. An engorged membrane partially or wholly closing the nasal duct retards the onward movement of the tears, containing as they do in suspension, the mucous and dust from the conjunctiva and cornea, and the excreted products from the interior of the eye. The presence of this accumulation aggravates the existing local conditions, and it would be just cause for surprise if nutritional changes in the mucous membrane of the drainage system did not supervene, and more or less complete closure of the duct result through thickening of the membrane.

That this reasoning is not at fault, is substantiated by abundant experience. Many cases might be cited in demonstration. The following will serve as the representative of a large group which might be brought forward:

A. A. B., æt. 60. In good general health, a wealthy merchant, has been annoyed by epiphora for twenty years. Now worse, now better, but never absent, but much worse of late years. He has been a life long victim to attacks of sick headache and "weak eyes." He is a great traveler, and a man of broad culture and general intelligence. Both inferior canaliculi had been slit by Abadie, and he has been treated by probing and syringing many weeks at a time in several European cities by surgeons of great celebrity. He had given up all expectation of relief from his epiphora, but came for some advice about his reading glasses.

O. D. V=6÷xxx+1.25c. ax. 180°. V. 6÷vi; O. S. V.=6÷xviii +.65c. ax. 30° V. 6÷vi. The ophthalmoscope revealed a large semi-atrophic crescent embracing the temporal margin of both optic nerves, the choroid was woolly in the periphery, and in many places honeycombed.

The tarsal borders of the lids were red and thickened, the retro-tarsal folds and caruncles swollen; the eyes were suffused with tears. No. 3 of Bowman's probes passed tightly, but smoothly, through the nasal ducts, and fluid passed freely into the nose. He was given a collyrium of boracic acid to use freely with an eye cup, and a solution of homatropine to be used three times daily. The eyes were to be protected by smoked glass in bright light, and all use at near work avoided. The general conditions rapidly improved under this regimen and the daily treatment of the tear ducts. In a week the correcting glasses were ordered for constant wear, and a suitable combination prescribed for reading. In a month his epiphora had disappeared, he had no return of his headache, and his visits ceased. In six months he returned with a slight recurrence on the right side. His glass over this eye no longer gave him normal acuity of vision, and it was found necessary to change the axis of the cylinder from 180° to 15° and to make it slightly stronger when the retention of tears again promptly disappeared.

Many cases of like import might be recorded if it were needful to enforce still further the wisdom of conservatism in the management of an affection depending upon what at first sight might seem a remote etiological factor.

Discussion.

Dr. H. Gradle, Chicago:—In connection with diseases of the lachrymal passages our treatment and prognosis can only gain in certainty by a strict discrimination between the different forms of disease. This is not sufficiently recognised in the text books, although the speakers who have preceded me may have pointed it out. We must exclude all cases of reflex lachrymation without disease of the ducts. As a rule we can get the distinguishing criterion from the patient, where the duct is open the tears run *through the nose* when the eyes water. If the patient does not give this history, we can test the patentcy of the duct with the syringe or probe. Generally that is superfluous. In speaking of disease of the lachrymal passages, I exclude all these cases of reflex lachrymation with patentcy of the duct, and refer to those only where the duct or sac is at fault.

The text books speak of two classes of disease of these passages: 1, stricture somewhere in the duct or sac. 2, suppurative dacryocystitis; but they make no great distinction in treatment. These two classes are not identical and can be thoroughly separated in every respect. Stenosis of some part of the tear passage, does not endanger the eye from infection. There is nothing but stagnation of tears. On the other hand suppuration of the tear sac is not necessarily accompanied by stenosis, although it usually is. I have often been astonished to find very little resistance in entering the suppurating tear duct with the knife. Moreover, a point which is not commonly known is that in small children suppurative dacryocystitis can be cured without any operative interference simply by expressing the purulent contents of the sac regularly for a few weeks in succession.

In looking over my experience for the past two years, I find that the cases of disease of the lachrymal passages presented one or the other of two different types. There is scarcely any connecting link between these two classes. One class of patients state that the eyes water only when out in the wind or when they use the eyes severely. In the other type the eyes water all the time and we see that the internal canthus is suffused with tears during the entire examination. The prognosis in the two classes is entirely different. What the pathological differences are, I am not prepared to say, but I can make this clinical distinction that in one class, there is lachrymation only from external stimulation, while in the other class there is continued lachrymation, evidently from some irritant point either in the nose or lachrymal passage. The first class of cases get well with very little treatment. If we split the duct freely in this class of cases, a single operation will be sufficient. I have also probed and syringed but have an impression that these procedures are often superfluous. In cases of non-suppurative stenosis of the duct, I find that one, two or three sittings with electrolysis are sufficient, provided the eyes water only

in the wind. On the other hand if the eye is continually suffused with tears, I have learned to regard the prognosis as very grave. A large proportion of these cases can be cured, but we cannot guarantee that there will not be a relapse. In other cases we cannot even cure the lachrymation temporarily if the patient does not continue treatment. a very long time. We can gain a great deal by paying attention to the nose, but even with that many cases of the second type can not be absolutely cured.

Dr. H. M. Starkey, Chicago:—I was particularly interested in Dr. Risley's paper, because some of the points made in the paper were the important points to which I had intended to call attention had I been able to prepare the paper announced upon the programme. For the past eight years, I have found it advisable to use the knife and probe less than formerly and the syringe more, and have found it unnecessary in many cases to slit the canaliculus which is so often done as a preliminary to the treatment of the nasal duct. I was pleased to see in Meyer's work that he condemns this as a routine treatment. It is certainly very easy in a large proportion of cases to so dilate the punctum as to allow easy ingress for a No. 7 or No. 8 Bowman's probe. Usually the tissues at the inner part of the eye are sufficiently lax to permit of the turning of the probe. If this can be done, it is of advantage as it does not produce mutilation.

When we come to the treatment of the nasal duct and the lachrymal sac, we have to note the different varieties of disease there present. The remarks which I make apply particularly to cases of catarrh of the nasal duct and lachrymal sac. We have here a condition different from that found in stricture of the urethra, to which these cases have been compared. We have a small bony canal with its periosteum and connective tissue lined with mucous membrane. These tissues very nearly completely fill the lumen of the canal, so that there is no patulous canal, or a canal through which a large volume of fluid can flow at any time, as in the urethra. Here a slight degree of swelling will necessarily close the canal against the passage of tears. In other similar conditions we treat the case mainly by topical applications to the inflamed mucous membrane, and if practicable this seems to me to be the most rational treatment to employ here. While in many cases, the probe is necessary, I have found almost uniformly that frequent probing is unnecessary, and the point which I make particularly and which has not been brought out here,is that we should teach the patient as early as possible to wash out the lachrymal passage for himself. They almost invariably say that they cannot do it and it is something of a trick but in front of a glass they can soon learn to introduce the nozzle of the syringe, and then they soon learn to do it without the aid of the glass. If this is done frequently and antiseptic solutions are employed, the cure is much more rapidly attained. Afterwards, the patients continue this treatment at home, the injections not being so frequently repeated.

Of the utmost importance to the patient is the choice of lachrymal syringe. The easiest for the patient to use as well as the simplest and cheapest is the ordinary glass medicine dropper with point so drawn out as to easily enter the dilated punctum. Armed with this instrument I cannot recall a case where the patient has failed in his attempts to irrigate the lachrymal passages.

Dr. George M. Gould, Philadelphia:—The last speaker recalls to my mind a little point. Some of you may not have seen the last number of the *New York Medical Journal*, in which I have described a simple method by which in epiphora, etc., the patient can treat himself. The head is canted back and the inner canthus filled with an antiseptic and astringent solution. Then, with the finger pressing on the sac, it is emptied. When the finger is removed the sac expands, and the fluid is drawn in. Then pressing back towards the nose, some of the antiseptic fluid is forced into the duct. By repeating this process, the duct becomes antisepticized. I have had excellent success with this method. One lady who had had dacryocystitis for about sixty years, came back in one week cured. There is one thing that it is well to bear in mind: Never destroy a physiological structure if you can help it. No one seems able to describe the function of the puncta, and we therefore act as if the puncta had no function. I think that it has a definite function, and that we should be slow to injure the puncta, for slitting destroys their function forever. The function of the puncta is, I think, to serve as sifters of dust, etc., preventing their entrance into the duct, and we should therefore hesitate before destroying them.

I rose, however, more especially to call attention to the method which I have described. Dr. Risley has demonstrated that the duct should never be injured by a probe being crushed into it. In that way cases are made obstinate by the contraction of cicatricial tissue. I have no doubt that in a few years the probe will rarely be used in any case of duct disease. If there is stricture, the method that I have described will do no good. If functional, as nine-tenths of duct troubles are, the result of slight inflammation closing the capillarity of the tube, this method differentiates it, and if it cures it that is all that is needed. If it does not cure it, cutting may be resorted to, as advised by my friend Dr. Thomas. I think that in the future, the two methods of treatment will be, the method which I have mentioned, and incision with a proper knife.

Dr. R. Tilley, Chicago:—The point advanced by Dr. Gould is an important one. I do not know that I have ever seen anything in regard to the function of the puncta, but it has seemed to me that they act rather as favoring capillary attraction than as sifters of dust, and that by this capillary attraction, the tears are passed down more readily than by a larger canal. For this reason I have interfered with the puncta as little as possible. If they are to be destroyed at all, I would rather do so by a clean cut than by stretching. I do think that we should avoid any disturbance of the anatomical character of the puncta as much as possible.

It does seem amazing to listen to the reports of cases of excessive lachrymation as cured by various methods. It seems to me almost as impossible to cure by the simple means referred to some of these cases of excessive lachrymation, as to make the waters of the Mississippi go down the channel of the Illinois River.

Dr. G. E. de Schweinitz, Philadelphia:—I have listened with pleasure to the scholarly paper of Dr. Gradle, and desire to refer to one or two points in this connection. He calls attention to the condition of the optic nerve in certain atrophic conditions of the nasal cavity. This relationship has received some notice in Germany, and my own attention has been called to it in Philadelphia by Dr. Harrison Allen. In some patients affected with atrophic rhinitis, an examination of the eyes will reveal distinct discoloration of the optic papilla, and although there may be no deterioration of central vision, there is often decided contraction of the visual field. This contraction may affect the form fields, or be limited to the color fields alone, and the contraction will usually be found to be greatest in the eye on the same side in which there is the most marked atrophy of the tissues in the nasal chamber. I understand very well what a large personal element enters into the taking of color fields, and how readily mistakes may occur, but if it is conscientiously done, repeated a number of times and, if necessary, controlled by independent observers, very trifling changes may be detected and very interesting results achieved.

Dr. Gradle's classification of the various causes for epiphora is interesting. In this connection I would like to call attention to the fact, well known, to be sure, but which often escapes attention, that epiphora may be one of the ocular symptoms, very well marked in cases of locomotor ataxia. I have sometimes seen it when other characteristic phenomena, for example, the Argyll Robertson pupil, temporary diplopia, insufficiency of convergence, anæsthesia in the area of the supraorbital nerve, and the early discoloration of the optic papilla, are absent.

Dr. Thomas, to my mind, has presented a strong argument in favor of stricturotomy in certain cases of obstructive disease of the lachrymal passages, and I am particularly impressed with the valuable points he has brought out, and with the ingenious knife which he has devised and exhibited. I hope when he closes the discussion he will state a little more explicitly the exact method of the introduction of this instrument.

Dr. Gould's suggestion, it seems to me, is worthy of careful investigation. In curious confirmation of what he says concerning the *habitat* of the gonococcus is the well known fact, especially dwelt upon by Horner, that gonorrhœal ophthalmia almost never produces dacryocystitis, because the germs do not find a favorable soil in the mucous membrane of the duct and sac. An exception to this is the association of purulent ophthalmia and purulent disease of the lachrymal sac in connection with certain exanthematous diseases, but then in these diseases there is also a rhinitis, which is probably the primary factor.

Dr. Leartus Connor, Detroit:—I have not had the opportunity of hearing all the papers, and perhaps the points which I wish to make have already been referred to. In the little note that I made yesterday, I called attention to one case in which exophoria produced distinct, long-continued

rhinitis. I have seen a number of cases in which the canaliculus had been slit and the duct treated with probes for a length of time, without satisfactory relief, entirely cured by the relief of an existing eye strain. In managing a case of epiphora, I first remove the eye strain. A large proportion of the cases in the early stages are relieved by removing this source of irritation to the lachrymal apparatus. I accept the view that if it be possible to maintain the anatomical and physiological structure of the lachrymal passages, it should be done. I have therefore followed the line of treatment referred to by Dr. Gould, and thus relieved a certain proportion of cases. Finally, we come to a class of cases where the disease is not relieved by the measures mentioned, and then the knife and probes have done me great service, and I should be loath to throw them aside. I have had the greatest satisfaction in the use of Williams' probes, but it is extremely difficult to procure these made in the proper way. The probe should be stiff and elastic, so as to bend without tearing the tissues. With these probes I have been able to pass through strictures of the lachrymal passages without injury to the tissues, a thing I could not have done so well with the stiff Bowman's probe.

Dr. Charles Hermon Thomas, Philadelphia:—In regard to the parallelism between the conditions found in urethral surgery and in that of the lachrymal duct, of course it is easy to force the comparison too far. The conditions are not identical, yet in some respects they are parallel. There is one point of likeness however, which may be stated emphatically, and that is that in treating stricture of the urethra, every good surgeon considers it all but criminal to make a false passage, and the same is true in regard to stricture of the lachrymal duct.

If there is one thing more than another which should be borne in mind in carrying out the plan which I have suggested, it is to *take time* to get though the stricture by means of dilatation, and not by forcing. No surgeon would think of making enough pressure to force a false passage in the urethra. He would repeat the attempt, sitting after sitting. In trying to get through these strictures I take all the time that may be required. I try first to coax through by the Williams' probe. If it does not pass, Anel's probe is to be tried. If this fails to find a passage, I wash the duct out with the syringe and tell the patient to come the next day. After a way through has been found the conical end of the stricturotome is to be introduced, and using it persistently as a dilator, it is passed through the stricture. Then a draw cut, not a cut by thrusting, is made. The incisions are to be made laterally and in front. In this way it is impossible to do harm.

A particular point is to be noted in regard to slitting the canaliculus and the opening into the sac. One gentleman asked if I had ever known an instance of shrinking of the opening into the sac. I have known such cases. This trouble was met with when I used the Weber knife. I now use a director and Beer's knife, pass it along until the knife has entered the sac completely, then withdrawing elevate it a little and cut upwards making a free opening in the sac. There is no more danger of such an opening closing than of the canaliculus closing.

I agree with all that has been said in regard to Williams' probes. As to Bowman's probes, if they are to be used at all they should be provided with conical tips.

Dr. Samuel D. Risley, Philadelphia:—I have but little to add to this interesting discussion, but am much gratified at the tendency to conservatism manifested by the remarks already made. What I wished to enforce in my paper was the possibility of treating these forms of disease without recourse to the violent measures which were employed during the early days of my ophthalmic career. I distinctly remember seeing large probes passed forcibly through the bony duct, which could have no other result than crushing the bone and doing permanent injury. Even in later years, I have seen cases where I felt sure that the existing form of the disease was due in large measure to the violent methods of treatment to which the duct had been subjected. I have had no experience with the slitting of so-called strictures of the duct. As I pointed out in the paper, I think that stricture in the ordinary sense, that is a closure of the duct at one point, is comparatively rare; that the closure is due to more or less uniform thickening of the lining mucous membrane, and reasoning *a priori*, to pass a knife through this, however gently, and cutting it must leave a scar in the mucous membrane, and every scar is an injury to the tissue. This is simply reasoning without experience, however, and I have no doubt that Dr. Thomas's observations have been accurate and thoroughly conscientious, and do not criticise his methods. It has always seemed to me to be more rational to get rid of the thickening of the duct by gentle means.

I was interested in Dr. de Schweintz' remarks in reference to the narrowing of the field of vision. I did not hear Dr. Gradle's paper, but judging from the discussion I think that he alludes to intra-ocular conditions found in association with nasal disease. I have seen a number of interesting things in this line and now have under treatment a young woman with impaired central vision and much contracted field both for form and red and blanching of the outer half of the optic nerve. I had seen her some years previously on account of a small coloboma of the nerve sheath. She came back with the condition described. Her father had had hæmorrhagic glaucoma, for which I did iridectomy and subsequently had to remove the organ. We can therefore understand what great anxiety must have been caused by the failure in the daughter's vision. I could find no intra-ocular cause for it. She also had violent hemi-crania. I examined the nostril and on the corresponding side found the cavity quite thoroughly occluded by hypertrophic tissue. After a few days' treatment in which the hypertrophy was removed, vision improved, the field for form and red became almost normal. The central vision also improved and the hemicrania disappeared.

Dr. G. A. Aschman, Wheeling, W. Va:—I was much pleased to learn of the advocacy of conservative treatment. I have always tried to avoid slitting of the canaliculus wherever possible. There is one point which should be emphasized to the profession generally. It has been the experience of every one to have a patient referred to him after the family physician has slit the canaliculus, generally he does not use probes. In the majority of cases this fails to give relief and the patient is sent to us. Often a great deal of harm has already been done. As Dr. Tilley thinks, there is a capillary attraction here which is lost when we cut the puncta.

In regard to the point with reference to gonorrhœa passing through the nostril to the eye. I was struck by the point all the more because in one of my cases after closing the puncta on one side, secretion seemed to increase on the other side. There is undoubtedly some connection between the two.

In regard to closing the puncta to prevent inoculation from the lachrymal sac, I would state that in speaking with Dr. Knapp, he said that he had used the electro-cautery but had not always succeeded in closing the puncta sufficiently. So far I have had no difficulty if it is thoroughly done after treating by injection the canaliculus and sac. There has been firm adhesion in all cases. So many eyes have been lost in this way that it is important that we should find some reliable means of excluding infection from the sac.

Dr. George M. Gould, Philadelphia:—I only wish to add a word in regard to Dr. Conner's case. The reports of such cases are often looked upon with suspicion. If there is anything certain it is the fact of the existence of reflex neuroses. I wish to support the case cited by Connor by a case of my own. Mr. T., a well educated gentleman and one who has not the least sign of hysteria, finds hat whenever he wears a stronger myopic lens given for temporary use than the one ordered "for constant use" he will have all the symptoms of an intense common cold. In two hours the nose will become congested and run, the voice will become hoarse—in a word there will be all the symptoms of an acute coryza. Putting on the weaker glasses these symptoms will in two hours disappear. This has been repeated so frequently that there can be no question in regard to it.

INSUFFICIENCIES OF THE OBLIQUE MUSCLES AND HOW TO CORRECT THEM.

Read in the Section of Ophthalmology, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY G. C. SAVAGE, M.D.,

OF NASHVILLE, TENN.

PROF. OF OPHTHALMOLOGY AND OTOLOGY IN THE MEDICAL DEPARTMENTS OF THE UNIVERSITY OF NASHVILLE AND VANDERBILT UNIVERSITY.

In the *Archives of Ophthalmology*, Vol. xx, No. 1, 1891, I announced my discovery of "Insufficiency of the Oblique Muscles." I closed that paper by saying of the nervous symptoms brought about by that state: "I can see no hope of prevention or cure." On the 17th day of May, 1892, while a patient was before me whom I had known to be a sufferer from

this condition for two years, and to whom I had often said, "There is not now, nor can I see how there ever can be, any relief for this trouble," a thought of the proper means of correction dawned upon me. I at once applied the newly thought of principle in this case, and with the most gratifying results. Of this case I shall have more to say before closing this paper.

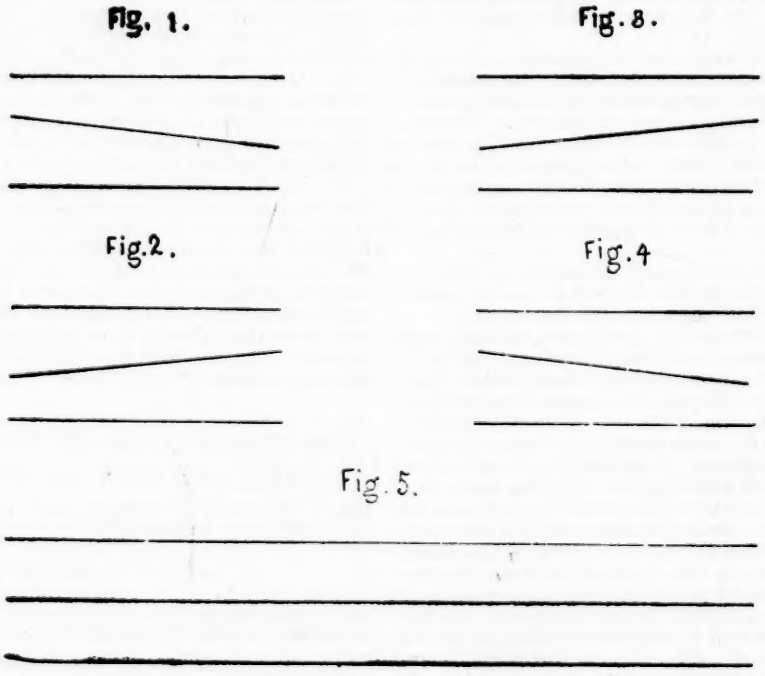
Before setting forth the treatment I will refer to the condition itself, and the proper means of detecting it. In doing this, since I cannot do better, I quote from my paper published in the *Archives:* "Every ophthalmic surgeon, however skilled in correcting errors of refraction and in operating for the different known forms of heterophoria, has had cases of eye-strain for which he could do but little. In investigating a few such cases during the last six months I have found the cause to be a want of equilibrium on the part of the *oblique muscles.* The detection of this condition is easy. I place a double prism (my modification of the Maddox prism) before one eye, the other for the moment being covered, and ask the patient to look at a horizontal line on a card held 18 inches away. The effect of the double prism (each 6° base in), so placed that the axis is vertical, is to make the line appear to be two, each parallel with the other. The other eye is now uncovered, and a third line is seen between the two, with which it should be perfectly parallel.

"While a change of the position of the axis of the double prism from the vertical towards the horizontal will alter the distance between the lines, their direction will be unchanged, hence no loss of parallelism. This fact admits of a little carelessness in the placing of the prism in the trial frames, though the axis should be vertical, so as to give the maximum distance between the two extreme lines.

"If there is a want of harmony on the part of the oblique muscles, this test will show it at once in a want of parallelism of the middle with the two other lines, the right end of the middle line pointing towards the bottom, and the left end towards the top, line, or *vice versa*, depending on the nature of the individual case.

"In my investigations I have always considered the eye before which no prism is held as the one under test. With the double prism before the right eye, the patient is asked about the position and direction of the middle line. It may be nearer the bottom, thus showing left hyperphoria; or again, it may extend farther to the right than the other two and not so far to the left, thus showing exophoria; or *vice versa*, showing esophoria. If the right ends of the middle and bottom lines converge while the left ends diverge, the superior oblique of the left eye is at once shown to be in a state of underaction. Fig. 1 represents such a test of the left eye. Fig. 2 shows a test of the left eye when the inferior oblique is the too weak muscle. Fig. 3 represents a test of the right eye, the loss of the parallelism between the lines being due to underaction of its superior oblique, and Fig. 4 the same condition of the inferior oblique of the right eye. Fig. 5 represents a test of both eyes when there is perfect equilibrium of the oblique muscles.

"As is well known, the function of the oblique muscles is to keep the naturally vertical meridians of the two corneæ parallel even when not vertical [except in cases of uncorrected oblique astigmatism as shown in Vol. i, No. 1, of the *Ophthalmic Record*]. This must be, or a troublesome form of double vision will result. If there is a perfect equilibrium of the obliques, this parallelism of the meridians named is maintained without trouble; but if the superior oblique of either eye be too strong for its inferior, or *vice versa*, the parallelism of the vertical meridians is preserved, and double vision prevented, only by excessive work on the part of the weaker muscle. This condition of the oblique muscles brings on, at longer or shorter intervals, a train of nervous symptoms for which, at present, I can see no hope of prevention or cure."



As can be readily seen, the condition described then was *symmetrical insufficiency of the obliques.* Up to

that time I had not seen, nor had I heard of, a case of *non-symmetrical insufficiency of the obliques*. Dr. Moulton, however, reported such a case in a letter[1] to the editor of the *Ophthalmic Record*. I had reasoned that such a condition would not give trouble, since the strong muscles would be allowed to act, thus revolving the two eyes in the same direction, but causing no disturbance of vision. I still believe this reasoning correct except in cases of corrected astigmatism. Such a case Dr. Moulton reported, asking for an explanation of the fact that it became necessary for him to rotate his 1.00 D. cylinders from 90° to 100°, in order that the patient might have comfort, when several examinations under atropia had shown that the axis of each cylinder should be at 90°. My explanation, published in connection with his letter, was that there was insufficiency of the superior oblique of her right eye and the inferior oblique of her left eye; that these weak muscles, at the times of the several examinations, exerted their full amount of power and thus kept the best meridians at 90°; that these muscles at other times, because of fatigue, could not exert the necessary amount of power, and thus allowed their stronger opposing muscles (the inferior oblique of right and superior oblique of left) to change these meridians from 90° to 100°. It was at such a time as this that the doctor learned that the axes of his cylinders should be placed at 100°. Comfort came to, and remained with, his patient as a result of this little procedure. It was good ophthalmic practice, and should be followed in all cases of astigmatism where there is *non-symmetrical insufficiency of the obliques*.

In *symmetrical insufficiency of the obliques* the case is very different, both in principle and practice. It is for this latter condition that I am now able to point out the remedy.

To illustrate clearly the principle and practice I will take up for study the case of J. B. M., age 35, whose case I was studying the moment the thought of the cure came to me. Two years ago he came to consult me about a headache that for a long time had troubled him, and which was growing more severe. He had been advised that it was probably due to eye-strain, and if so, it could be cured by properly adjusted lenses. A preliminary examination showed only a slight error of refraction. This he consented to have corrected, hoping that he would get relief, other means having failed. Under homatropine the following correction was given:

O. D. V. 20-xx with + .25 ⊂ + .25 cyl., ax. 155°.
O. S. V. 22-xx with + .25 ⊂ + .50 cyl., ax. 90°.

It was determined at the same time that he had left hyperphoria. It was also determined that he had insufficiency of both right and left superior obliques. He was told that all but the latter could be corrected; that he would get some, but not complete, relief by wearing his sphero-cylinder lenses, the left ground on a prism of ½° base down; that, at times, the insufficiency of the obliques would give him trouble, for there was nothing that could be done for this condition. I did tell him that if, when engaged in near work, he felt a headache coming on, he might cover one eye with a flap, thus doing away with the strain necessary for harmonious action of the muscles of the two eyes. This he tried occasionally, but found it very inconvenient to work with one eye only. His attacks of suffering were greatly lessened in both frequency and severity for some months, as a result of the elimination of some of the factors formerly constituting the cause of his suffering.

He wore his spectacles continually, but after awhile his headaches began to return. They grew more frequent and more severe until he became an almost daily sufferer. Not infrequently on going home from his office his wife would have to put him to bed like a child. He would occasionally take medicines prescribed by his family physician to relieve the severity of the attack.

[1] See Ophthalmic Record, Vol. I, No. 4, 1891.

At intervals, during the whole time, he would consult me. When complaining I would tell him that I believed that the then-active cause was the insufficiency of his superior obliques, and that I was powerless to do more than I had already advised. A few months ago I made a second examination of his eyes under the influence of homatropine, but only to find that the result of my former examination was correct. I did not have to urge him to wear his glasses, because he had learned that he was more comfortable with than without them.

On the 13th of May, 1892, he came to me and said that I must do something more for him; that he must have relief. Reminding him that I had twice investigated his eyes and each time found the same conditions, and had corrected all that was correctable, I told him that I was willing to try again, but that I was now as unable to correct the insufficiency of his obliques as I ever was. In the course of this conversation I told him if he had but one eye, he would not be a sufferer. Deciding that it would be four days before he could return for another examination, he went away. On the 17th at the hour appointed he came, and without hope of finding an additional means of relief, I undertook the investigation again. The results of former examinations as to lenses were confirmed. My study of the recti muscles resulted as formerly in finding a left hyperphoria of ½. With the remark, "We will now look into that incorrectable condition," I began to investigate the obliques. Placing the 6° double prism before the right eye, the left eye (the one under test) showed the middle line dipping unmistakably to the right, as in Fig. 1, thus showing insufficiency of the left superior oblique. Transferring the double prism to the left eye, the right eye showed the middle line dipping to the left, as in Fig. 3, thus showing insufficiency of the right superior oblique. Having stated again that nothing more could be done for him, in a moment the thought occurred to me that, if a cylinder were placed before the eye in such a way as to make the line incline still more in the same direction, on removing the double prism the weak obliques would have to act more than usual in binocular vision. I reasoned that this overaction being in the nature of gymnastic exercise, if conducted properly must develop the weak muscles, and thus be a source of relief to the patient. Leaving the double prism in front of the right eye, I placed a + 2.00 cylinder before the left, and revolving it so as to bring its axis to 135°, the middle line was seen to dip very much more to the right. I then turned the axis back to 90°, when the dipping was the same as when no cylinder was on. Turning the axis of the cylinder to 45°, the middle line was made parallel with the other two (this little procedure of placing the axis of a cyl. obliquely first in one direction, then in the other, and watching the effect on the middle line, will establish or disprove the correctness of the diagnosis). The diagnosis made and positively confirmed, I at once commenced the gymnastic exercise by placing a + 2.00 cyl. before each eye, the axis of the right at 70° and the axis of the left at 110°. The patient was asked to fix his vision on a candle 20 feet distant (the double prism had been removed). In three minutes the axis of right cylinder was turned to 60° and that of the left to 120°; three minutes later the axis of right was placed at 50° and that of left at 130°; and again in three minutes the axes were changed, the right to 45° and the left to 135°. With each turning there was additional demand made on the superior obliques, the maximum being reached when the axes were respectively at 45° and 135°. With each turn the patient could feel additional strain. The cylinders were allowed to remain in this position of maximum effect three minutes, when they were removed and the double prism test was applied. There was the slightest, if any, dipping of the middle line. Both patient and practitioner felt encouraged. He has returned daily for the *exercise*, which has been conducted every time in the manner above described.

On the day after the first *exercise* he resumed his office work, which requires almost continuous near use of his eyes, and has been absolutely comfortable up to this time—the end of the eleventh day, and not one dose of medicine has been taken. For the last three days, before beginning the *exercise*, the test when applied to either eye showed but little, if any, want of parallelism of the lines. His improvement has been rapid and remarkable.

I have now under the exercise treatment a little girl, age 15 years, whose trouble is insufficiency of the inferior obliques. The dipping of the middle line is to the left in the left eye and to the right in

the right eye—just the contrary of what was found in the other case. The *exercise* in her case is carried on by revolving spasmodically the axis of the right cylinder from 90° to 135°, and that of left from 90° to 45°, the reverse of the plan in the first case. She does not bear the exercise as well as the first patient, but her improvement in five days is noticeable.

My records for the past two years show a number of cases of *symmetrical insufficiency of the obliques*, to all of whom I stated: "For this condition I can do nothing."

The condition is real, the treatment is rational and relief must follow. The condition is easy of detection and the insufficient muscle can be quickly located. The double prism before the right eye, the middle line is seen by the left (the one under test); if it dip towards the opposite (right) side, the superior oblique is insufficient (see Fig. 1); if towards the same side, the inferior oblique is insufficient (see Fig. 2). The same is true when the right eye is under test, as is shown in Figs. 3 and 4. In the treatment either concave or convex cylinders can be used; if the concave are used and the insufficiency is in the superior obliques, the axes must be placed in the lower nasal quadrant, if in the inferior obliques, then the axes must be placed in the lower temporal quadrant. If for the exercise the convex cylinders are chosen, the axes must be placed in the lower temporal quadrant for insufficiency of the superior obliques, and in the lower nasal quadrant for insufficiency of the inferior obliques. In either case the effect is increased as the axis is made to move from the vertical to the point of maximum effect, which is 45° from the vertical. The exercise may be commenced with a .50 to a 1.00 D. cylinder, and increased each day a .50 D. up to 3.00 D. The cases will be very rare that will require a stronger exercise cylinder than the last mentioned. The graduated exercise should be continued not longer than twelve or fifteen minutes daily. Each eye being affected, the exercise cylinders are placed before both at the same time.

Discussion.

Dr. H. Gradle, Chicago:—Any one taking the trouble to examine the eyes of healthy individuals as to the condition of the muscular balance can convince himself that in a large number of individuals, the muscular balance is not perfect when binocular vision is absolute. There occurs vertical and lateral, as well as the rotatory deviations, described by Dr. Savage. Whether these deviations are the cause of the eye strain and other nervous symptoms attributed to them by certain eye surgeons, is an open question and I do not think that this is the proper time to discuss that question, but I would ask whether any tests have been made to prove whether or not the symptoms of eye strain and nerve strain are due to the deviation. According to the theory, the muscles are strained in the interest of binocular vision, and if binocular vision is excluded the eye takes a position of rest. If one eye is excluded from work, there should be no eye strain. Has this experiment been made to determine whether the eye strain, headache, etc., were abolished by the use of one eye with the other excluded from light? I have done so in a certain number of cases of strictly latent deviation and found the test negative.

Dr. Charles Hermon Thomas, Philadelphia:—I have had some experience in the line which Dr. Gradle suggests. I have tried covering one eye where there were phoria faults and found negative results very largely; wearing the cover introduces a disturbing element. A better test is to correct the fault with prisms and note the results. Under these circumstances the answer is usually positive.

As regards the particular point raised in the paper, I made some tests according to the diagram of Dr. Savage in his publication of last year, and found that they held perfectly, but came to the conclusion that I could see nothing to be done in these cases. Exercise of the muscles of the eye with prisms has not yielded satisfactory results in my hands. The cylinders used as described by Dr. Savage seem to act as prisms do on the recti, and I should expect the same negative results which I have obtained from prisms used to exercise the other muscles. From an experience growing out of some hundreds of cases of graduated tenotomy I am satisfied that the latter may be expected to give much better results.

I did not mean to be understood as disapproving of the use of prisms for the direct compensation of defects made out. I have the greatest appreciation of them for this purpose, especially in the lower degrees. I do not believe, however, in the value of prisms as a means of exercise to permanently influence the nutrition of weak muscles.

Dr. Leartus Connor, Detroit:—My experience with the use of prisms differs from that of Dr. Thomas. Possibly the method of using partially accounts for this difference. I employ round prisms, so as to be able to shift them at any angle according as the weakness of any muscle may require. The prisms are set in ordinary spectacle frames that they may be worn constantly during a longer or shorter period as each particular case may call for. By such use of prisms alone, I have seen many cases of eye strain so completely relieved, that the patients were enabled to resume their ordinary duties, without the permanent use of any prism. It must be said that most cases of heterophoria are cured by the proper correction of their refraction. Such relief of heterophoria is most satisfactory. The class relieved by prisms just mentioned were those in which either there was no refractive defect, or it it existed, its correction left a distressing heterophoria. Another small class of cases require the constant use of prisms and experience such comfort and relief, that they will not part with them or consent to a radical cure by tenotomy.

In a fourth class of cases all the measures mentioned fail, and a more or less complete tenotomy is called for. Here the results I have found most satisfactory. I never do a tenotomy until convinced that spheres, cylinders or prisms are insufficient to give satisfactory relief. By their aid I have not yet failed to relieve the cases of insufficiency of the oblique muscles, described by Dr. Savage. It will give me pleasure to re-study the subject in the light of his interesting paper, and if the treatment suggested proves easier and more satisfactory, to accord him my cordial thanks.

Dr. G. C. Savage, Nashville:—One of the gentleman asks for proof that these muscle conditions can be properly charged with the suffering that we see. He wants to know if the correction of the error of refraction will not afford relief. I am before you a personal example on this point. I have a moderately high degree of astigmatism which was corrected some ten years ago. Before that I had sick headache. The sphero-cylinders which I wore relieved me of the pain above the left eye especially. From that time until eighteen months ago I would every week of my life, especially after I exercised myself in work, have a band-like feeling across my head from ear to ear. Dr. Stevens of New York, had told me that I had half a degree of left hyperphoria but I did not attach much importance to so low a degree; but I decided to have the left lens ground on a half degree prism base downward. There has never been that band-like feeling since. Eight years ago, I corrected the vision of a patient with hypermetropic astigmatism. I did not test for any muscular error. The sphero-cylinders gave relief for possibly two years. The suffering then began again and she finally lost the ability to read; and about two months ago she returned. She had about ten degrees of exophoria and I operated on her. There has been no suffering since I did the partial tenotomy of the rectus muscle.

Trying to use one eye is a source of trouble to any body. If we could get accustomed to it, heterophoria would be relieved by excluding one eye entirely. It has been claimed that when one eye was lost the other was stronger than the two had been. We now know why this is true. A simple prism will not exercise the oblique muscles in any position. The prismatic effect of a cylinder does exercise the oblique muscles as can be proven readily.

HYPOSULPHITE SODA IN GASTRO-INTESTINAL ANTISEPSIS.—According to Goll the abandonment of sodium hyposulphite in treating diseases of the stomach and intestines for other and newer remedies is a great mistake. In solutions it is far more efficacious than resorcin and all other stomachics used in the treatment of gastric and intestinal catarrh. Especially does it seem indicated in chronic catarrh: its effects in this direction are very marked.—*Pacific Record.*

EMBOLISM OF THE CENTRAL ARTERY, A THROMBOSIS? WITH REPORT OF A CASE.

Read in the Section of Ophthalmology at the Forty-third Annual meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY S. C. AYRES, M.D.,
OF CINCINNATI, O.

When the diagnosis of embolism of the central artery of the retina was made by V. Graefe in 1859, and so satisfactorily confirmed by Schweigge a year or two later by microscopic sections of the same eye, it seemed to have settled a hitherto obscure point. The pathological alterations coincided so exactly with the supposed cause of the sudden blindness, that no conditions were wanting to completely explain the case. The brilliancy of this case has not been dimmed by the passing years, for but few have been reported which have such clear cut points. In fact, subsequent investigations have shown that other pathological conditions may produce very similar subjective and objective symptoms, and it becomes a question of great interest to determine whether we are dealing with a case of embolism of the central artery or of thrombosis of the veins.

In 1874, the late Dr. Ed. G. Loring, of New York, reported in the *American Journal of Medical Sciences* five cases which had been designated as embolism by himself as well as by some of his colleagues, but where subsequent developments led him to change his opinion.

In his excellent Hand Book he discusses the subject in an exhaustive manner, and concludes by saying that in cases of so-called embolism, "too much significance has been laid upon the stoppage of the circulation by the importation of a plug formed at a distance, while not enough stress has been laid upon the mechanical actions regulating the supply of blood within the eye, as well as upon the conditions of the walls of the vessels themselves or their contents."

The ophthalmoscopic picture which embolism of the central artery of the retina presents, is familiar to you all, and I need not recall it. An empty condition of the central artery is prima facia evidence of an obstruction at some point, but is that necessarily an embolism? May it not be a thrombosis?

In Angeluccis' case it was shown that thrombosis of the vein caused occlusion of the artery by mechanical pressure.

Œdema of the retina, cherry red macula and narrowing of the arteries were all present here, yet the microscopic examination showed the arteries free from obstruction, and the disease limited to the veins. From a study of the recent literature on the subject, it seems that the opinion is gaining ground that many of the so-called cases of embolism are due to thrombosis of the artery or the vein. Is it necessary to wait for a post-mortem to settle these questions positively, or can we not by a careful differentiation decide while the case is still under observation?

Priestly Smith argues that spontaneous thrombosis of the retinal arteries may account for both the permanent as well as transient blindness. In *Oph. Review*, 1884, he differentiates spontaneous thrombosis as follows:

Previous attacks of transient blindness occurring in the blind eye as well as in the fellow eye, and associated with signs of disturbance of cerebral circulation at the onset of the blindness and with giddiness, faintness or headache.

The diagnosis of embolism so far as any systematic disturbances are concerned, is negative.

Michel, in 1878, in Vol. XXIV, *Graefes Archiv.*, reports seven cases of thrombosis. In one the microscopic examination showed that the lumen of the central vein was completely blocked by an organized thrombosis. The arteries were not diseased. He recognizes three degrees of obstruction.

1. Complete closure of the central vein associated with numerous hæmorrhages into the retina, and a grayish discoloration in the macula region with the usual cherry red spot.

2. Incomplete closure when all the conditions are much less intense, and 3, a simple stasis of the venous system with few ecchymoses and marked dilatation of the veins.

Hæmorrhages seem to be the most significant alterations in favor of thrombosis. They are more or less abundant, being dependent according to Michel in the degree of obstruction in the vein, and yet they are present in well authenticated cases of embolism.

Gowers says that thrombosis has been observed in the retinal artery with ocular signs identical with those of embolism.

Thrombosis of the central artery is reported by Parinaud (*Gaz. Med. de Paris*, 1882), followed by cerebral softening. In this case there was sudden loss of vision, diminution in the calibre of both veins and arteries, œdema of the retina and hæmorrhages, and rapid development of atrophy of the disc.

Loring says that "all the cases of occlusion of the artery have been declared hitherto, by their authors at least, to be due to embolism in contra-distinction to thrombosis, but it must be admitted that *a priori* there is no reason why thrombosis should not occur."

In the discussion of a case of embolism of the left central artery by Dr. Oliver in the Trans. of the Am. Oph. Soc., 1888, Dr. H. D. Noyes remarked that in reality a large number of those cases are due to thrombosis, and this is proven by microscopic examinations. He said also that about the only typical case of embolism was that of Graefe.

What then have we to fall back on as positive evidence of embolism? The primary ophthalmoscopic appearance should not determine this point, but rather the secondary or remote conditions which follow sudden loss of sight—complete obliteration of a vessel, atrophy of the optic nerve, and total or almost total loss of vision.

Embolism is supposed to depend on organic valvular heart disease, and yet in Angeluccis' first case of thrombosis, the patient had organic heart disease and valvular softening, and yet the autopsy showed the arteries healthy and the disease entirely in the vein.

Allow me to present you in detail a case which came under my observation recently:

Mr. B., æt. 83, gave the following history, on March 22, 1892: he stated that he awoke this morning about six o'clock and at that time his eyes were all right. He then took a nap of probably half an hour, and when he awoke, his vision in the left eye was almost obliterated. I saw him about ten o'clock and then his vision was so reduced that he could only count fingers at 2'. His field of vision was entirely obscured except in a sector like space below, through which he could count my fingers at 2'. The retina presented

an appearance very closely resembling embolism of the central artery. There was an opaque area of retina crescentic in shape extending from the disc to the macula both above and below. It was not so white as is sometimes seen, but presented more of a feathery appearance. The optic disc was normal in appearance, and no traces of an obstructed vessel could be seen. Neither the arteries nor the veins were altered in appearance. The macula presented a cherry red appearance, but no hæmorrhages of the retina were visible. The next day vision was 0.6, on the 24th 0.8, and on the 26th, four days after the attack, central vision was perfect. The field of vision gradually widened on both sides from below upward, and when last examined a few days ago, there was only a blank in the field directly upward. The œdema of the retina faded out in about a week, and the cherry red appearance in the macula in two weeks. Was this an embolism? probably not. Was it a spontaneous thrombosis according to Priestly Smith? Was it a thrombosis as is described by Michel of the third degree—a simple stasis? In this case the patient had been indulging in stimulants and tobacco freely for some months previous, and particularly so on the night before this attack occurred. Is there not a direct relationship between the engorgement between the cerebral and the retinal vessels and the œdema of the retina?

REPORT OF A CASE OF ZONULAR ATROPHY OF THE CHOROID.

Read in the Section of Ophthalmology, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, June, 1892.

BY R. TILLEY, M.D.,
OF CHICAGO, ILL.

J. N. O., age 66 years. One of a family of two children. Father and mother lived to the age respectively of 63 and 81. No recognized defect in the eyes of father or mother. Father afflicted with a contraction of the subcutaneous fascia of palm of the hand, resulting in the condition known as Dupuytrien's fingers. Patient's brother, now dead, was afflicted in a similar way in the right hand, but only one finger was affected. Patient himself, who was for a great part of his life an English sailor, has marked, severe contraction of several fingers, involving both hands, clearly referable to similar condition of the subcutaneous fascia. He has now and has had for ten years at least, a remarkable intermittent pulse; remarkable in that there is a decided regularity to the irregularity. I took a tracing of it, but finding that it really failed to give any accurate conception of it, I have not thought proper to produce it. Patient has a son-in-law, a physician, who writes me that he observed this irregularity ten years ago. In order to get as definite a view as possible of the condition of the heart I referred him to Dr. R. H. Babcock, who reported as follows:

CHICAGO, May 3, 1892.

Dear Doctor:—Please pardon the tardiness of my report concerning Mr. Owen, whom I examined last Friday. The irregularity of his pulse struck me at first as being an example of the pulsus trigeminus, but on more extended palpation, it was found to intermit at regular intervals. Sometimes there was an apparent intermission due to a pulse wave that was scarcely to be felt. I then auscultated the heart while feeling the pulse, radial, and it seemed to me that at times the heart contracted without forcing a pulse wave all the way to the wrist, but as to that I am not quite positive.

There is no evidence particularly of extended arteriosclerosis, although his age would render that condition probable in a measure at least. There is marked evidence of heart degeneration. He says he sometimes has pain and stiffness in the joint of the right big toe, but without enlargement. He suffers also with great flatulent indigestion, which has been the case about ten years. There is such an absence of symptoms referable to the heart, that it seems to me his intermittency of pulse must be due largely to reflex causes. Very sincerely yours,

ROBERT H. BABCOCK, M.D.

He suffered some ten years ago from an excruciating pain—"a boring pain" which, as far as I can make out was referred either to the heart or stomach. The doctor in attendance, Dr. Heydock, now dead, confessed that he could not satisfy himself as to the cause of the pain. He suffers at times now from some pain in the lower part of the back, extending downwards in the region of the sciatic nerves. He has had two children and only two; one only is living. There is no evidence of lues that I can elicit. There is no evidence of renal affection.

The external appearance of both eyes is normal, with the exception of a certain amount of chronic conjunctivitis. No adhesion of the irides, but the pupils do not dilate under mydriatics *ad maximum*.

In both eyes there is incipient capsular cataract, both most pronounced in the infero-internal quadrants—the best eye, the left, giving the most evidence of cataract.

The curious feature which has induced me to report the case is the peculiar form which the degeneration of the choroid of the right eye has assumed. I have called it zonular atrophy of the choroid. The peculiar band of atrophy does not occupy exactly the position which it should occupy relative to the poles of the eyes to fully justify the appellation. It forms, however, a distinct band, the relative position of which will be best understood by the accompanying diagram. You will see that the band is represented a

good deal wider at the bottom than at the top, and the part near the optic disc possesses quite an amount of choroidal tissue which clearly supplies the blood to the island of relatively normal tissue. In the lower part the sclera is plainly visible, traversed only by some retinal vessels. The edges of the pathological tissue are clear cut, not black, in places brownish, and the area embraces the macula.

After considerable patient observation I can detect no visible difference between the choroidal tissue forming the island and the general choroidal tissue. When the communicating bridges disappear the whole island of apparently normal tissue will disappear, and leave the sclera exposed throughout the whole area similar to the wider area below.

The sensations which he complains of are floating objects, a dark brown area in the centre and upper part of the field of vision—both of them sketched out for me on a piece of paper—and a continual whirl of different colors before the eyes, most manifest in the affected eye and more troublesome in a bright light. The colors he compares to the colors of the flower, the sweet william. Whether the whirling sensation complained of also in the relatively healthy eye is referable or not to pathological changes in the right eye, I cannot determine. I suppose that if such a sensation is due to the disturbed circulation of the choroid, the sensation would be shared by both eyes. I will add, moreover, that a very small patch of pigment, quite black, has been observed in the lower part of the fundus of left eye, the region corresponding to the region of greatest atrophic development in the eye under consideration. It will be interesting to observe if that peculiar subjective sensation will disappear with the completion of the atrophy of the choroidal bands now uniting the island to the remaining choroidal tissue.

Whether that spot of pigment in the lower part of fundus of left eye is the commencement of a similar process in that eye, it is impossible to divine. I have had the case under observation now for about five months, and I can observe but little change.

NAPHTHALINE IN THE TREATMENT OF WHOOPING COUGH.—The treatment of whooping cough by means of naphthaline fumigation is recommended by Chavernac (in *Bull. Gen. de Ther.*). About half an ounce of the drug is, on one or more nights, made to burn in a suitable vessel in the sick room, the windows and doors being tightly closed. The cough at once moderates, the dyspnœa and other symptoms are favorably influenced, and the attack is soon brought to an end. Complications may contra-indicate the employment of the remedy. Those individuals suffering with pulmonary tuberculosis cannot bear the treatment.

SECTION ON NEUROLOGY AND MEDICAL JURISPRUDENCE.

Chairman, Dr. Harold N. Moyer, Chicago, Ill.
Secretary, Dr. Geo. R. Trowbridge, Danville, Pa.

The Section met in the hall of the Young Men's Christian Association, Detroit, at 3 P. M., June 7, 1892, and was called to order by the chairman.

In the absence of the secretary, Dr. Trowbridge, Dr. W. J. Herdman, of Ann Arbor, Mich., was elected secretary *pro tem.*

1. The first order of business was remarks by the chairman of the Section, Dr. Moyer.
2. Paper by Mr. Henry A. Chaney, with discussion.
3. Paper by Dr. Comegys, with discussion.
4. Paper by Dr. Hughes, with discussion.
5. Paper by Dr. Mills, with discussion.
6. Paper by Dr. Kiernan.
7. Paper by Dr. Chaddock, with discussion.
8. Papers by Drs. Rockwell and Fell, with joint discussion.
9. Paper by Dr. Howell, with discussion (paper not received).
10. Paper by Dr. Sanger Brown, with discussion.
11. Papers by Drs. Bremer and Lydston, with discussion.
12. Paper by Dr. Fuller.
13. Paper by Dr. Manley, with discussion.
14. Papers by Drs. Crothers, Dewey and Talbot, with discussion.

The following papers read by title:

1. Paper by Dr. Moyer.
2. Paper by Dr. Wright.
3. Paper by Dr. Mason.
4. Paper by Dr. Norbury.

REMARKS BY THE CHAIRMAN.

BY HAROLD N. MOYER, M.D.,
OF CHICAGO.

Gentlemen: The address which I had prepared on the organization of the work of this Section is no longer suitable. I had outlined in that address what I conceived to be the best organization to the end that we should develop our own autonomy to some extent on the lines adopted by the Section on Ophthalmology. But the action of the Association this morning in creating an Executive Committee for the Sections, and giving it power to formulate some general rules for the conduct of the Association in the future, has made my address somewhat inappropriate; therefore, I will not deliver it, but instead will briefly refer to a few points of an historical nature.

It was many years since Dr. Ray instituted a section on insanity in the American Medical Association, which was continued for some years and did good work. For some reason that section was finally discontinued and its work was merged into the Section on the Practice of Medicine. Thus, for a number of years—at least, more than a dozen—there was no special section for the discussion of neurological subjects.

In 1884, Dr. Quimby, I think, introduced a resolution creating a Section on Medical Jurisprudence. The following year this Section was instituted, and the Section held its first meeting in Cincinnati. We had then some six papers on the program and about four or five members to listen to them.

The following year the scope of the Section was enlarged by the addition of neurology, and at the Nashville meeting we had a fair attendance and a few excellent papers. The next meeting at Washington showed renewed interest in the work of this Section, twenty-two papers were read, and the attendance was large. From these small beginnings the work has gradually developed until we present you to-day a program containing forty-one titles, many of them from the pens of the most eminent neurologists in this country.

I think we can congratulate ourselves on the success of the work of our Section; one of the youngest, it has shown a vitality and growth that has in some cases outstripped its elders. I feel that without making invidious distinctions that I can especially mention the enthusiastic work of Drs. Hughes, Kiernan, Crothers, and Evarts. It is due largely to the persistent work of these men that we have achieved such a signal success; with such a past we can confidently look forward to the near future when the meeting of this Section will show as good work as is done by any similar body in this country. (Applause.)

RESPONSIBILITY IN WILL-MAKING.

Read in the Section of Neurology and Medical Jurisprudence, at the Forty-third annual meeting of the American Medical Association, held in Detroit, Mich., June 7, 1892.

BY HENRY A CHANEY,
OF DETROIT, MICH.
PROFESSOR OF MEDICAL JURISPRUDENCE, MICHIGAN COLLEGE OF MEDICINE AND SURGERY.

It is and has long been the all but universal rule that one must be of sound mind to make a will that will stand. It is so laid down in the statutes of nearly all the States. If this rule were rigidly observed, many more wills would be set aside than are. But the courts have greatly relaxed it, so that absolute soundness of mind is now by no means a condition to the making of valid bequests. The old English law was that a single foolish word would spoil a will, and so recent a chancellor as Lord Brougham decided that any degree of mental perversion would be fatal. But when Sir Alexander Cockburn came to the bench, he changed the whole current of the English law on that point. In the case of Banks *v.* Goodfellow, 5 Q. B. 549, he stated in the clearest and most positive way the then existing rule and the reasoning that supported it. The rule was, that any degree of mental unsoundness, however slight, and even though it exercised no influence on the will and was wholly unconnected with the disposition the testator made of his property, was fatal to the will. And the reason was that the mind, though it has various faculties, is one and indivisible; if it is disordered in any one of these faculties—if it labors under any delusion arising from such disorder, though its other faculties and functions remain undisturbed, it cannot be said to be sound; such a mind is *unsound*, and testamentary incapacity is the necessary consequence. By way of answer to this, Sir Alexander reviewed in an elaborate opinion the condition of British and Continental jurisprudence on this point, and found it either unsatisfactory or superficial. Turning, then, to the American decisions, and especially to certain New Jersey cases, he commended the good sense of the American law, and said in his own convincing fashion, that if it were conceded that the only legitimate ground for denying testamentary capacity to persons of unsound mind is their inability to take into account and give due effect to the considerations which ought to be present to the mind of a testator in making his will, and to influence his decision as to the disposal of his property, it follows that a degree or form of unsoundness which neither disturbs the exercise of the faculties necessary for such an act, nor is capable of influencing the result, ought not to take away the power

of making a will, or place a person so circumstanced in a less advantageous position than others. And later English cases have been decided accordingly.

To get the full force of the Lord Chief Justice's reasoning, it should be stated that the Banks whose will was in question in this case had once been unquestionably insane—had been confined in a county asylum, and when discharged had remained subject to certain fixed delusions. He had long had a deep aversion to one Featherstone Alexander, and though the man had been dead for years, Banks still believed he continued to follow and molest him; the mention of his name threw him into violent excitement. He also believed himself to be molested by devils whom he thought visibly present. At the time he made his will he had been having a succession of epileptic fits. But on the other hand, he managed his own limited affairs and was careful of his money. Notwithstanding his antecedents, and in direct contravention to what had been the law of England as laid down by her judges, Chief Justice Cockburn held that his will was valid.

A short report of a few of the more important recent cases in this country, relating to testamentary capacity, may be of interest, and possibly of some service as at least a basis for further inquiry. Their net result, however, as matter of law, if summed up at the outset, is that the more recent rule already explained remains substantially unchanged, and, if anything, receives a more and more liberal interpretation, and that the courts seem less and less inclined to interfere with wills on the score of mental unsoundness.

Bannister v. Jackson, 45 N. J. Eq. 702.—In 1887 there died at the German Hospital in Newark one George M. Bannister, who had made a will three years before by which he left his wife $500 in addition to her dower right, and his daughter a like sum, which was not to be allowed to get into the hands of her husband. Her husband, by the way, had been dead for two years. Bannister left the rest of his estate, which was all personal and amounted to $12,000 or $14,000, to four brothers living in England. He had been for twelve years a chronic drunkard, who saw strange sights, whose hand trembled continuously and who when sober, was nervous, sleepless and irritable. He died of chronic alcoholism, and his widow and daughter resisted the probate of his will on the ground that his condition deprived him of testamentary capacity. The Prerogative Court, however, found from the testimony that he had managed to keep his business together and to sell it to good advantage, and that some time after his will was made he had been elected a director of the Mutual Building and Loan Association of Newark—an office he had previously held and resigned—and was considered by his fellow-directors a man of excellent judgment. At about the same time he hired out as foreman at fifteen dollars a week, and after lending his employer a thousand dollars upon security, he so managed as to become the owner of the business. As he was not drunk when he made the will, a majority of the court sustained it.

Clifton v. Clifton, 47 N. J. Eq. 227.—In 1887 Marian Passage, a New Jersey spinster about 83 years old, and who died within two years afterward, made a will by which she left the whole of her small property to a niece who had lived with her for thirty-five years, and who had been, as the old lady said, a daughter to her. A previous will, made in 1873, had so disposed of the property that a brother of this niece would have shared it equally with her. This brother tried to break the later will by a showing of testamentary incapacity, and to that end put in evidence that at about the time the old lady made it her memory had failed so that she would forget words and could not talk connectedly; that her table manners were revolting; that she played with a doll—which, by the way, he had brought to her; and that she was continually folding little rags and arranging them in her work basket. He also produced a negro servant of hers, whom he had previously employed, who swore that on one occasion Miss Passage asked what certain objects were that she saw from her window, across the street, and on being told they were men asked what men were. On the other hand, the lawyer who drew the will said that before drafting it he had talked with the testator a few minutes in order to satisfy himself as to her mental capacity; that she seemed infirm, but able to talk connectedly upon an important subject, and that she gave her instructions without difficulty or assistance. The Prerogative Court sustained the will, and cited near a score of cases in which the New Jersey courts had held that one might have capacity to make a will even though his memory was imperfect and greatly impaired by age or disease, and he might not be able to recollect the names, the persons or the families of those with whom he had been intimately acquainted, and even though he did childish things at times or talked disjointedly, flying abruptly from one subject to another, or asked idle questions and repeated those which had before been asked and answered.

White v. Starr, 47 N. J. Eq. 244.—In 1889 the Orphans' Court of Camden County, New Jersey, rejected the will of Jesse W. Starr, which had been made five years before when the testator was seventy-five years old. Mr. Starr, who had begun life as a mechanic, had created at Camden one of the largest and most successful iron working establishments in the United States—a concern that cost a million dollars but in the hard times following the panic of 1873 became bankrupt for nearly that amount. An attempt was then made to run these works for the benefit of creditors, but incompetent management by his sons brought the experiment to a disastrous end. He had a son-in-law, however, named White, who did much to relieve his embarrassments, and who furnished him with a home in the last years of his life. The will in question was the last of three, all of which were well adapted to the changing conditions of his fortunes, but the last, after referring to the large advances he had made to his sons, left both of them a nominal sum only, and bestowed the greater part of his remaining property on his daughter, Mrs. White, who had never had any considerable sum of money from him. And her husband was made sole executor. Mr. Starr's sons and another son-in-law contested the will, and made a strong showing of mental disorder. He had once called on a druggist to have an old toothbrush refurnished with bristles; he had made a practice of buying candy, distributing it among children, and offering it to grown folks; he had once got his granddaughter to play the piano, and as she did so he danced in the presence of guests; he would make aimless calls upon his friends, look often at his watch while with them, shake hands with them repeatedly, and reiterate the expression of

his pleasure at seeing them; he would ride constantly upon the railroad—so constantly that the president of the company sent him a free pass—but he would restlessly shift his seat while on the train, often stand up as it approached a station, and on one occasion, when he went into a smoking car, he shouted "no smoking, no smoking," several times, used insulting language to one of the smokers, and then, sitting down in front of him he kept mumbling to himself the most insulting of the expressions he had used. It was the commonest of things for him to fail to recognize his acquaintances even after he had been told their names; he had been known to ask where he was when only three blocks from home; once, after waiting a few minutes in a barber shop, he arose, stroking his chin as if he had been shaved, and handed the barber his quarter; when the barber said he hadn't shaved him yet, he put the money in his pocket, mumbled and went out; and he used often to tell this barber about a coat which he had had made in Ireland, and which he called his Irish coat. But on the other hand, there were many gentlemen of the highest standing who certified to his intelligent conversation with them, and some of them had heard reports of his mental failure, and were on the lookout for evidences of it. One of these gentlemen had told Mr. White that the impression was getting abroad that Mr. Starr's mind was affected, and had advised him to have the question laid at rest somehow. White laughed, but afterwards quietly invited two physicians, one of whom kept a private asylum, and the other was consultant on insanity at the Philadelphia Hospital, to visit his father-in-law. The first reported that if he had never heard of Mr. Starr, he would never have thought for a moment that there was anything mentally wrong with him; he might have thought from his way of eating that he was slightly peculiar and eccentric, but nothing more. His opinion was that his mind was sound and his memory good, but that like most old people, he could not stand such a prolonged mental strain as he could have stood earlier in life. The other physician said that the impression he received was that Mr. Starr was somewhat enfeebled physically, probably by age, and that his mind acted slowly, but intelligently; he saw nothing to indicate that he was not competent to make a will. The Prerogative Court concluded that while all the evidence could not be reconciled, that which was free from prejudice and interest showed a case where second childhood was asserting itself, and where there was an occasional and transitory loss of complete control of his mental power, but that the testator was usually in possession of his faculties. "It cannot be said"—remarked the judge—"that such a man does not possess capacity to make a will." The decree of the Orphans' Court accordingly was reversed.

Spratt v. Spratt, 51 N. W. Rep. 627.—A case for which there was as little foundation as one can well imagine, was that of Albert Spratt, of Jackson County, Michigan, an old bachelor farmer who died at seventy-one of pneumonia, leaving an estate worth nearly one hundred and twenty-five thousand dollars, which he willed to a score or so of relatives. If he had died without a will the whole would have gone to two sisters and the children of three brothers, and the sisters would have taken twenty-five thousand dollars each. It was an object, of course, to break his will, and the usual process of attacking his testamentary capacity was resorted to. The testimony mainly relied on to accomplish this, was that of the physician who attended him in his last illness, which took place in November, 1886. He had warned Spratt that he would probably not get well, and had asked him if there was any business he wanted to attend to. "Why, yes," said the farmer, "I want to make my will," and that evening he directed a nephew to go next morning for a justice of the peace, whom he knew, to draw it. The will was drawn accordingly next day, or rather was dictated by the testator and written down by the justice. The doctor was present part of the time, and occasionally administered doses of whiskey, quinine and carbonate of ammonia to his patient, who sat up most of the time, leaning his head upon the back of another chair. The doctor was napping, off and on, in an adjoining room, and did not know that a will was being drawn until it was nearly finished. He talked with his patient, of course, and says that most of the time he thought him sane and rational, but flighty some of the time. His flightiness, so far as appears, seems to have consisted in his muttering a good deal to himself—in his wanting to pull on his boots and walk out doors, saying that he thought it would do him good—and especially in his upbraiding the doctor for not giving him a longer warning, and complaining to a neighbor that the doctor had promised him three days' notice. It may be added, by the way, that he did in fact live four days. But the Supreme Court said it was difficult to see anything in this. The doctor farther testified that he was of opinion that the day the will was made the farmer's physical condition in consequence of his disease, was such that he could not have carried any lengthy statement of facts in his mind. But the Supreme Court point out that he did in fact, unaided, dictate consecutively, bequests to many relations, near and remote, and they ask what, under the circumstances, an opinion is worth that he couldn't do what he certainly did do. Of course they sustained the will.

Among other recent cases of this class are two of small importance except as they involve the question of the influence of a dying man's physical condition upon the working of his mind. One of these was an Iowa case in which the will of Michael Duggan (*Duggan vs. McBreen, 43 N. W. Rep. 547*) was contested on the ground that when he made it his mental powers must have been greatly impaired because he was suffering from "a kind of diabetes" which in its last stages tended to produce coma, and was aggravated by fistula and gravel, all of which presumably exhausted his system, especially as he was a man of 67. The Supreme Court said that none of these facts, taken alone, would establish testamentary incapacity, but thought that their weight, when taken together, was a question for a jury. The other was a Minnesota case (*Hammond vs. Dike, 44 N. W. Rep. 61*), in which a codicil executed the evening before his death by a man 75 years old, was disputed because most of the time during his final illness, which lasted less than two days, he was apparently unconscious, and the illness, which began with severe pain, soon brought on great bodily weakness and prostration. Some medical witnesses thought his unconsciousness was coma, caused by uræmic poisoning due to kidney disease. Medical experts differed on the trial as to the measure of consciousness and mental capacity which he may have had or which would be compati-

ble with his physical condition. One of them said it was not unusual in uræmic conditions for patients to arouse to a sound mental condition. A jury sustained the codicil: the Supreme Court sent the case back for additional evidence and declined to express any opinion as to the sufficiency of the showing made.

Another class of capacity cases, on which, it seems to me, the law needs more light, and will be glad to get it from medicine, is that in which the disturbing element is spiritualism. The attitude of the Courts on this question is that while so-called spiritual manifestations are, no doubt, as vice-chancellor Gifford called them, "mischievous nonsense" (*Lyon vs. Home, L. R. 6 Eq., 655*), still, it cannot be said that a belief in them is such an insane delusion as will defeat testamentary capacity and invalidate a will. They can as yet be induced to go no further than to say that such a belief may result in the exercise of an "undue influence." The celebrated Judge Gresham had a case before him in 1883, in which John Thompson, aged 74, had left all his property to Mrs. Amanda Hawks, who professed to be a medium, to the exclusion of his only son and heir. (*Thompson v. Hawks, 14 Fed. Rep. 902.*) Thompson had shown signs of aberration, and there was insanity among his relations. He began to talk among his acquaintances about sending messages to his deceased wives, and receiving them from them. When he visited Mrs. Hawks he carried with him a little basket of delicacies for these wives, and told some of the witnesses that she would forward them. He told several people that he had been directed by the spirits of his wives, through Mrs. Hawks, to dispose of his property; they had advised him that it was necessary for his "development" as a medium and had enjoined him to "do well" by Mrs. Hawks. The judge set the will aside and said: "It is useless to discuss here the proposition as to whether or not a spiritualist can make a valid will, or as to whether or not a man who has a monomania on one subject is capable for the general transaction of business which does not concern that subject. The testator was in a weakened state of mind when he came under the influence of a spirit medium. He embraced spiritualism as practiced by the spirit medium, and instead of merely believing in it as an abstract proposition, he became possessed by it and suffered it to dominate his life and override every other consideration. His belief in it was artfully used by the spirit medium—the only one it appeared, whom he ever consulted—to alienate him from his only son and child, and to get his property."

Middleditch v. Williams, 45 N. J. Eq. 726.—On the other hand when William H. Livingstone, who died at Newark in February 1888, and whose family consisted of his little daughter Lillian, seven or eight years old, and his mother-in-law Mrs. Marie C. Williams, he left every thing by his will to the mother-in-law, to go at her death to her son, Wm. P. Williams, but to be held in trust for Lillian until she should marry or reach the age of 25. If she should die before the mother-in-law the latter should take the property; if both died before Wm. P. Williams, he should have it all. No provision at all was made for Lillian's children if she should have any. An effort was made to set aside this will on the ground that Livingstone was incompetent to make it, his mind being occupied by the insane delusion of spiritualism. He had told several persons that the spirit of his wife had told him through a medium in 46th street, New York, to provide for her mother; to give *all* the property to her and do it in such a way that none of his own relatives could get it from her. The judge thought this was hardly evidence of an insane delusion. It seems that when Livingstone first attended a séance he was skeptical, but when the spirits inscribed upon a brooch worn by his mother-in-law, there present, the word "Dickie," which was a pet name of his wife, and made it blaze out in letters bright as diamonds—then he believed. The judge held that he had been convinced by evidence—such as it was—and his delusion was therefore at most an error of judgment.

In this case the judge's illustration of an insane delusion was by supposing one, without evidence of any kind, to imagine something to exist, which did not in fact exist, and which no rational person would, in the absence of evidence believe to exist; and he said the only way in which such irrational belief could be accounted for was that it was the product of mental disorder.

This definition was with great technical skill turned upon those who sought in the Ward will case, here, seventeen years ago, to identify a belief in spiritualism with insane delusion. Captain Eber B. Ward had been one of the most considerable capitalists in the northwest, and was a man of extraordinary force, who carried on successfully a vast complication of diverse business interests. He had died in the street of an apoplectic stroke, and some of his children wished to set aside his will in which he had provided more liberally for his second wife and her children than for them. Ward had dabbled extensively in spiritualism, frequently visited a local medium, had consulted with others, professed to imagine himself advised by a spirit whom he designated as "Cabbage John," and on one occasion, on being told by a medium that the spirit of ex-senator Jacob M. Howard was present, he had offered to shake hands with the ghost and had held some conversation with it. The accomplished Dr. Alonzo B. Palmer was examined as an expert in insanity. The examination was conducted by the late Theodore Romeyn, one of the most astute lawyers at the Detroit bar, but the cross-examination was in the hands of an equally keen lawyer, the late D. Darwin Hughes.

Mr. Romeyn asked the question: "If a man fancies he sees the spirit of a deceased acquaintance standing before him, what should you think was the condition of his mind?"

Here Mr. Hughes interposed: "I object to that," said he, "unless the gentleman complete the hypothesis by the supposition that the spirit is not really there. Otherwise there is no delusion."

The judge said "I think you will have to complete the hypothesis in that way, Mr. Romeyn."

But Mr. Romeyn, instead of completing the hypothesis, argued his right to ask the question, unless it were assumed, as a matter of law, that there were such things as spirits, and he did not think such an assumption could be made.

Mr. Hughes retorted that the field of superstitious belief could not be invaded. He could put any number of witnesses on the stand from the time of the Saviour to this day, to swear that all who believed in the miracles of the Saviour were deluded.

Under the judge's ruling, however, the hypothesis

had to be completed as Mr. Hughes had suggested, and the witness naturally answered "Of course that would be a delusion."

"Certainly, it would," said the crafty Mr. Hughes. "That's giving the witness the definition of a delusion, and then asking him if it *is* a delusion."

The foregoing cases have been for the most part cases in which wills were sustained through thick and thin. By way of instructive contrast may be given an Illinois case(*American Bible Society v.Prince*, *115 Ill., 624*) where what may be called a religious delusion upset a will very speedily. Whether it would have been sustained if the testator had been a spiritualist is another matter. Isaac Foreman died in 1878 at the age of seventy-four owning a hundred thousand dollars worth of property, and leaving a widow and a married daughter, the latter being destitute. His will gave his widow a life-estate in the homestead, his household and kitchen furniture and the farm, stock and tools. Everything else was to be sold and two thousand dollars invested for the daughter and her children; of all the rest two-thirds was to go to the American Bible Society and one-third to the Missionary Society of the Methodist Church. A jury found his will invalid, and the Supreme Court sustained their conclusion, which they said they were bound to do, if there were any evidence to support it. They thought there was such evidence. Foreman was admitted to have business capacity, equal if not superior to that of the average of mankind, owning and constantly increasing, as he did, a large property which needed good judgment, prudence and diligence for its successful management. But he had said in class meeting, while speaking of his children and family, that he was afraid of his life; he had also said he was harassed all the time for money by agents for churches, orphan asylums, colleges and schools and bible and missionary societies; that his mind had been injured by their solicitations, their argument being that his future happiness depended on his liberality; and finally, that he had said he intended to place his money where it would roll up and roll up and roll up until the day of judgment to work for old Isaac Foreman. This daughter had been his favorite child, yet he dressed her poorly, gave her but little education, kept her out of company and worked her as a field hand. The Court say they "find it difficult to believe that an egotism which is so extravagant and distorted that it regards only self in this life, and in the life to come, that wholly disregards and ignores the natural claims of a needy child, known to be worthy and dutiful and loving, and the affections ordinarily implanted in the heart for such a child, can consist with a mind entirely free of disease causing morbid delusion."

These are recent specimens of American jurisprudence bearing upon responsibility in will-making. They involve the effects upon the mind of gross intemperance, senile dementia, disease and approaching dissolution and the illusions of credulity and fanaticism. It will hardly be expected that one who can discuss this subject, if at all, from the standpoint of the law alone, can add any thing to the medical learning upon it. But a lawyer can ask questions which a doctor cannot answer. At least it is to be feared so. If the doctor can and will answer them it will be a distinct gain to both professions.

We would like, then, in the first place, with respect to insane delusions, a definition of them that shall not come out at the same hole it went in at.

We would like to know—and this is a bold query—whether, notwithstanding the law, spiritualism is not in fact an insane delusion; and if so, how potent it may be in the destruction of testamentary capacity.

We would like to know whether dementia, short of absolute idiocy, may amount to such complete and comprehensive unsoundness of mind as conclusively to invalidate a will whatever the character of its provisions. Indeed, can a person so demented have or express any will at all; and may not the will of any person less affected be valid?

We would like to know whether coma implies unsoundness of mind any more than sleep; and if not, how then can coma cut any figure in the invalidation of wills.

And we would like to know whether, in spite of the classical maxim,there is any such necessary connection between a sane mind and a healthy body that any enfeebled, disordered or diseased condition of the latter—short of delirium—implies as matter or fact or law a technically "unsound" condition of the former.

Discussion.

Dr. J. G. Kiernan, of Chicago, Ill., was of the opinion that the paper propounded a good many difficult conundrums. With regard to the question of definition, even the law does not profess to give any definition other than a relative one. In judging, therefore, what is an insane delusion, we must not judge so much by the character of the delusion as the state of the man. For example, a belief in witchcraft at a certain phase of our civilization was fully in consonance with the belief of the majority of the people in a normal state of mind at that period. To believe in witchcraft at a certain period was a normal thing. When educated men trained in the sciences of to-day believe in witchcraft, there is a natural question, is not such a man insane? The vast preponderance of evidence in such a case would be in favor of insanity. To illustrate: I had under my charge in an insane hospital, a man who had been a member of our own profession, who had received an academic education, who had lectured in a college on botany and chemistry. That man was found on one occasion to keep at a distance from a certain patient in the ward. He was asked why he did it. He said the man had bewitched him. Before this, this man, who was a much demented individual, had inflicted on this physician (so he believed) all sorts of tortures by electricity. He was shown that such use of electricity was impossible, whereupon he abandoned the belief so far as electricity was concerned, but to account for his feeling, he adopted the hypothesis of witchcraft. In these cases we must consider the surroundings of the men.

With regard to spiritualism, I think the same test can be applied. It seems to me in the case cited where a man left his money to a medium, and the court held that the man was mentally impaired, that it was right, because he was unable to separate from that medium the phenomena with which he was surrounded, but this was an evidence of undue influence.

With regard to lucid intervals, one case occurred in England, and one or two in the United States, in which an insane woman with restraint of some sort on her limbs, was able to dictate a will, and the court held that the logical character of the will proved a lucid interval.

A person in a state of coma would be incapacitated to make a will; but there are many conditions which resemble coma in which a man can recover perfectly. The question comes up, not what is an insane delusion or an incapacitation of testamentary capacity generally, but what is it in a particular case? Like a number of alienists, I believe there exists a certain class of the insane whose wills should be held valid so long as there is no evidence that the delusion affected the testator's mind. It is a little in the direction of the spirit of the common law. In civil affairs the insane are apt to keep along the ordinary routine of life; in criminal affairs their insanity is most often apparent.

Dr. T. D. Crothers, Hartford, Conn.:—In my experience

the question of validity of a will depends upon the soundness and reasonableness of the instrument. I have seen instances where a person in an insane condition made a will which was admitted as a rational instrument without question, because the assignment of the property was correct according to reasonable and rational grounds. To what degree is the instrument rational, reasonable? An instrument is sound when there has been an even disposition of the property. If the property is badly arranged, badly disposed of, the question of soundness of mind comes up, and it may not have been mentioned before during the lifetime of the individual, yet the character of the will will indicate at once a mental defect.

A case was tried recently in New York in which a man's soundness had been previously unquestionable. He conducted his business in a most excellent, sane way. At his death a will was found, disposing of his property in an irrational way, and because of that, the question of soundness was raised and some facts worked up, until it was evident that the man was a lunatic. He had concealed his delusions, and his insanity was unknown.

In another case, in which a will was made by a man who was notoriously insane so far as religious belief was concerned, not a question was raised in court as to the soundness of the instrument and the apparent rationality in which the property was disposed of.

Dr. C. K. Mills, Philadelphia, Pa.:—The questions asked by the gentleman who read the paper (Mr. Chaney) are difficult to answer in a satisfactory way. Dr. Kiernan, in his remarks, struck as nearly as possible the solution with reference to delusional cases, when he said that we must not consider so much the conditions of the delusions as the state of the patient's mind. This is the key to the matter. Here appears a great difficulty with judges and lawyers. To illustrate with reference to the delusions, it is perfectly clear to me, as it is, I have no doubt, to others, that a man may have a delusion relating to certain facts; that he may make statements in support of his delusion, which may be true, and yet the man's mind may be in a delusional state. A man may have the delusion of marital infidelity; he may have the delusion of conspiracy or persecution in any of its forms; his wife may be unfaithful to him, others may conspire to injure him in the way he thinks, yet after all it may be a delusion so far as his mind is concerned. We have to study both the facts and the mental state of the alleged lunatic. A judge once asked me when I made a statement like this, "Do you mean to tell me that a man can have a delusion of marital infidelity, and that man's wife be unfaithful to him at the same time in the way he thinks?" I said "Yes." A man may not have any knowledge of the facts of the case about which he is delusional.

Mr. Chaney asked "whether dementia, short of absolute idiocy, may amount to such complete and comprehensive unsoundness of mind as conclusively to invalidate a will whatever the character of its provisions?" A question of that kind shows the impossibility of a lawyer, who is not posted in medical matters, comprehending the subject. Dementia, of course, is a relative matter, and each case of dementia must be studied for itself. Insanity is relative; dementia is relative. We may have 30 or 50 per cent. of dementia in a case; each case must be studied by itself.

Now as to coma, true coma precludes the possibility of a man having testamentary capacity at that time; yet I have seen in my wards at the Philadelphia Hospital a patient stricken with apoplexy, and practically comatose for all purposes—but the patient rallied every five or ten hours, had lucid intervals, and then sank again into a comatose state. He finally died, and on making a post-mortem examination I found evidences of three stages, or separate attacks, of hæmorrhage in the brain. Such a case once came before the Philadelphia courts.

The points brought out by Dr. Crothers are well taken, yet I do not think the instrument itself should in every case determine the validity of the will. Take the case of a delusional lunatic. We had a man in Philadelphia who was on trial as to his sanity some years ago. The case was a famous one. Seven physicians, men of more or less eminence, testified as to his insanity; but a veterinary surgeon and the jury declared him to be sane. He clearly had delusions, but he had conducted his civil affairs properly, and he was worth perhaps $50,000 or more. He might have made a will perfect in its terms, which would have had on its face every appearance of rationality, yet that will might have been one which was influenced by the delusional state of his mind. Take again senile dementia. An old man or woman—and I have seen a number of such cases—has profound delusions of penury, and turns against sons and daughters who have taken the best of care of him or her. A will perfectly rational to all appearances may be made, and yet it may be the outcome of a delusional mind.

Dr. C. B. Burr, Pontiac, Mich.:—It has seemed to me for many years that the pendulum has swung too far in the direction of latitude in will-making. There are those states which appear in connection with senile dementia, for example, in which perversions of feeling display themselves, but where there is no lack of knowledge as to the terms of a will, or the effect of any of its provisions. A person suffering from impairment of mind of this nature is still considered capable of making a will, although manifestly the perversion of feeling, not amounting to fixed delusions, may have a strong influence in determining the character of the instrument. Such cases as these, as well as others with fixed delusions, should be weighed carefully by the courts in the determination of the question of testamentary capacity. The legal theory as to the reason for the supervision of wills by the courts is, I apprehend, that through this supervision, injustice to dependent relatives may be prevented. If this idea is correct, it seems to me that all these matters should be taken into consideration, for it is in just this class of cases—cases of senile dementia and dementia after paralysis, with strong perversions of feeling, but without delusions, that injustice is most apt to arise. Cases of this nature are most perplexing, alike to the courts, juries, attorneys and experts, and should be thoroughly gone into.

Dr. H. N. Moyer, Chicago, Ill.:—I will attempt to answer Mr. Chaney's questions in a general way. As I understand it, all lawyers would like a foot rule which will measure 12 inches. As a matter of fact, the expert, when he examines these facts, has a foot rule that is 9 inches long in some cases and in others it measures 15 inches; in other words, he examines the facts in relation to their surroundings and by the character of the individual, the time and place. Dr. Kiernan has reflected that idea perfectly.

I wish to mention an instance of a lawyer who is unquestionably insane. He has been tried half a dozen times. He came into my office and asked me to examine him and testify as to his sanity on the following day. This lawyer I have known for years; we grew up together and attended the same school. He called me by my given name, and said, after a conversation extending over nearly an hour, "Do you see anything insane about me?" I replied, "I see no marks of insanity as far as this conversation goes: nevertheless I believe you are insane." He said, "How do you come to that conclusion?" I answered, "Frank, your cigar has gone out at least 20 times in this conversation; you have used about 20 matches to relight it, and they are all strewn about the carpet." This showed a heedlessness amounting to actual disease. In a man who had been brought up in the best of circumstances and amid refined surroundings, it argued an absolute degree of mental aberration. Suppose the case was taken into court, the lawyer might ask, "Doctor, is every man who throws burnt matches on the floor insane?" The foot rule in this case does not measure 12 inches. A variable standard is set up that judges the man by himself, his surroundings, education, time and place. What is an insane act at one time and under certain circumstances may under a different condition be compatible with perfect sanity.

Dr. John Morris, of Baltimore, Maryland, said his observation and experience had been that persons with senile dementia were liable to be unduly influenced by the surroundings in the matter of making wills. He had never seen a man that suffered from senile dementia strong at any time. He, however, consented to witness wills made by such patients, first taking the precaution to ascertain whether the wills were equitable and impartial. Dementia has many phases and degrees and frequently testamentary power is not totally impaired. Memory of all the functions is the most sensibly affected in senile dementia.

Dr. W. J. Herdman, Ann Arbor, Mich.:—In regard to the question under discussion, I wish to say it is an extremely vital matter. Mr. Chaney, who is a lawyer of experience, one who has been the Supreme Court Reporter of Michigan for a number of years, comes before this body, reviewing cases that have actually occurred in his own experience, asking us certain vital questions. We know that the lawyer and the physician on the witness-stand have long been at variance in matters of definition; they have both long desired to get at the truth. The lawyer asks the physician to define certain terms; to explain certain conditions, that in this way certain misunderstandings may be cleared up. Would it not be profitable for us in our line of work to ap-

point a committee to answer the questions that have been asked?

The Chairman:—Yes, if you will put your remarks in the form of a motion.

Dr. Herdman:—I therefore move, Mr. Chairman, that a committee of three be appointed by the Chair to take the questions propounded by Mr. Chaney under consideration, to report at the next meeting.

Seconded and carried.

A HEALTHY BRAIN IS NECESSARY TO A FREE WILL.

Read before the Section of Neurology and Medical Jurisprudence at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY C. G. COMEGYS, M.D.,
OF CINCINNATI, O.

The essential element in the human mind and what distinguishes each self from every other one, and by which our capacity for independent action exists —is the will. In mere bodily organization there is great uniformity, but this marvelous machinery does not constitute self, that directs and moves the organized frame. No more can the organs of sense through which we gain a knowledge of the materials and forces of nature, constitute our personality; nor does the mass of ideas and conceptions, the intuitive consciousness, the perceptions and logical forms, which are so similar in the common mind, involve the element which makes each human being distinct in himself from humanity at large. The essential fact in human consciousness; that which expresses spontaneity, power and ability for independent action is the volitional or regulative faculty. Without this magnificent principle all of the phenomena of mind would be ranked but as so many links in the chain of cause and effect which are exhibited in the universal operations of nature. Men would then be mere things—impersonal and irresponsible.

It is the activity, therefore, of this faculty that regulates our mental nature and our independent life. It is, indeed, intuitive; nevertheless, needs to be educated; it must be free in order to govern the lives of men.

The brain is the material basis of the mind, and is subject to all the physiological and pathological laws of other viscera; it has a great range of capacity as an organ; it needs a simple supply of blood for mere nutritive changes, but a much greater and momentary one when supporting mental actions. The vital chemistry must no where have freer play than here. It must rest, too; it becomes fatigued by ordinary and unexciting uses; but inordinately employed for long periods the balance of nutrition becomes disturbed; it wears excessively, its organic tone is lowered, and it loses ability for normal manifestations of mind.

The mind is builded by the gradual formation of ideas, the materials of which are derived through the senses, but are shaped into concepts by an innate faculty. The accumulation and retention of these form the raw materials of our intelligence. These factors, great or small, are stored away in associated forms and constitute our judgments of things more or less compound and complex. They are inseparably connected with our emotions, and moral and religious sentiments which constantly guide us in the discharge of our duties. A man in a controlling position should be able to employ all these resources calmly and sagaciously. His capacity for sound judgment and self-possession rests upon his intellectual possessions and the due restraint of his affective nature. Now, this due exercise of mind for our self direction depends upon the integrity of that dominant faculty which we call—the will.

Under this autonomy we possess powers for generalization, or abstraction of our conceptual stores; but if this master faculty be in abeyance, which it is, under conditions of functional or organic lesion of its material basis, our self possession is lost, and we become creatures of mere impulse—may I not say mere automata! The fine powers for analysis or synthesis are shattered, and what remains of mind is a mere exhibition of associations of ideas. The treasures of knowledge are still held, but no longer coherent and under discipline; like a ship under sail without a rudder, backing and filling, a mere drift; or an army without an adequate commander to direct its march or its battles.

This supreme mental force is no "transcendental entity" to be considered apart from physical existence, but may be said to be the correlative of the totality of the organic power of the brain. It is, therefore, only a well rested, well nourished and properly exercised brain that can display the freedom of this magnificent endowment of man. Thus it is, that psychology comes under the autonomy of the medical profession. The progress of physiology and pathology have shed immense light on the relations of the brain and the mind. From a remote period the brain has been known as the center of sensation and motion, but only within a few years have they been definitely located in the cerebral mass; and the specialization of areas in relation to their functions is now so well known, and their coördination for the execution of instinctive and acquired movements, that we can put our fingers on the exact regions where exists our capacity to think—the area where sensations are shaped into concepts—where ideas are symbolized in language—where memory holds its seat, and the imagination displays its marvellous powers. All the apparatus of our organic life—the organs of respiration, digestion, circulation, excretion and the great neuro-muscular systems, are merely to sustain and develop a definite region of the periphery of the brain, which can be covered by two hands. This is the realm of consciousness—the plane where spirit greets matter and the healthy life which enables a man to say "I know that I know; I feel that I feel; I think that I think;" it is where the human consciousness equipoises the cosmos. Gravitation is instantaneous in its action; consciousness just as rapidly reaches from the center to the circumference of the universe. Who but the physician has the right to supervise this dread region? Closer than the minister of religion, or the ties of blood, he stands the guardian of its illimitable faculties.

Through physiological research psychology has been lifted above the misty, subtle reasoning of the schoolmen into the light of a new day, and is now comprehended as never before. Metaphysics is no longer a jugglery with words and phrases, but is a function of consciousness only existing in a healthy brain; it is the purest and highest expression of reason, and cannot be displayed when the brain is functionally or organically unsound; it is a psychological systemization of ideas under the regulative faculty—the will—whereby the intuitional phenom-

ena of thought, and the phenomena derived through the senses from external objects—the ideal and the real—the subjective and the objective—are brought into accord, and the consciousness is freed from baleful illusions, hallucinations and delusions. The imperfect state of consciousness in unsound sleep wherein ideas flow freely, regulated only by the law of association, represents an abeyance of the metaphysical faculty. We are led everywhere by the most absurd, grotesque, or fearful ideation without self-control, until further aroused and the spell is broken. There is no metaphysics in dreams.

The due development and direction of brain life, appertains to hygiene and sanitation. The manner of living, therefore, is of the first importance in order to obtain a healthy brain structure. This relates to air, clothing, food, exercise, employment and sleep. Whatever impairs any one of the great organs will, sooner or later, involve the health of the brain.

While the mental power of a race, or of an individual may be lowered to almost a brute state by exposure in inclement seasons, with inadequate clothing, poor food and bad air; on the other hand softness and needless indulgence, frivolity and luxury, lead to effeminacy. Children should be the offspring of healthy parents and be reared on plain substantial food; and, at the same time, the means of abundant and attractive exercise in the open air should be afforded. Instead of sleeping in heated rooms, luxuriously furnished, they should be without fire except in quite cold seasons, and be free from the decorative garniture of our fashionable people; and the hours of sleep should be ample and regular. Physical hardihood will thus be secured and the material basis of a strong mental and moral character be laid down. But the future character of an individual thus endowed with physical health will depend largely on ancestral conditions and the moral, religious and intellectual training which he receives.

We should always make a distinction between *impulse* and *will*. From the invariable manner of accumulation and association of the mass of ideas which constitute intelligence; over and above the immense number of actions that are normally automatic, there are constantly seen those which are the result of mere impulse, therefore involuntary, and not in any strict sense those which are willed or voluntary.

The impulsive and involuntary ones, in the sense I mean, are those which a sound will should be able to restrain. These impulsive actions, morally speaking, are the dangerous ones in our lives; for though they are so often good and commendable; yet they are constantly liable to be wrong. To restrain these and subrogate them completely to the will should be an aim in education.

The will can originate nothing, it can only take of the ideas which we possess and coördinate and direct them. It is by the will, I repeat, that we analyze and compound our notions, calmly reflect on our mental stores, and make such selection of them, and give such a direction to our thoughts as subserve our purposes in investigation, reasoning, and a final judgment on any given occasion. By our will we direct our way; by our impulses we are led, and too often driven. By early, constant, well directed training, more especially by inculcating habits of strict obedience to authority, whether relating to superiors, to sound precept, and the restraint of emotional impulses, the supremacy of will may be firmly established: and this is made more certain by the fact that the material basis of the mental and moral nature grows to conditions under which it is continually exercised.

The domination of the will is indispensable in concentrated thought: the control of the sensibilities is equally important; for unless feeling, appetite, desire are under government, our character is too unstable for the fulfillment of our responsibilities in society. Reason, reflection and judgment are all frequently overcome by the suggestions of appetite and passion; unless a strong rein is held by the will over the affective faculties.

There are mild and apparently innocent mental indulgences which exert, nevertheless, bad influences upon character. I refer to reverie—day dreaming—a species of mental intoxication, in which the mind is abandoned to drifting under the influence of mere association of ideas. There is no will in exercise; the imagination governs thought, and this sort of sublimated egotism, gives so much pleasurable cerebral excitement that, unless resisted, establishes at length a species of mental constitution akin to insanity. Every physician meets with cases where this pernicious mental habit involves, more or less, the reasonable actions in the individual. Habitual indulgence in mild reverie has a tendency to dementia; "day-dreaming" (castle building) attended with excitement as it often is, especially when related to great expectations, tends to a "delirium of greatness."

More attention should be given to this subject. It is to be hoped that physicians will study carefully its evil tendencies. Teachers, too, must awake to a consideration of its deleterious effects upon a pupil's mind. It is bad enough to be subject to this dream life when we are in unsound sleep; but every one should be warned, when awake, to keep the will, and not the imagination, at the helm for the voyage of the day.

To "keep cool" under exciting circumstances, to keep silence under great provocation, form great factors in magnanimous men; all of which depend so much upon the culture of the will.

More important still, is the use of the will, and not the memory, merely, in the exercises of schools and colleges. It is undeniable that the method of teaching in American schools has been grounded too largely on exertions of the memory in acquiring tasks. Lessons have been memorized, and not acquired by effort of the understanding; hence, they are not well retained and furnish a poor basis for wide intellectual culture. A lesson cannot be understood by an act of the memory. Severe efforts at memorizing in order to make a good recitation (cramming) fatigue the brain and lower the power of the intellectual faculties. It is not a process of ideation. The most eminent authorities in psychology agree that all sensations contributing to ideation must be symbolized or objectified *by the mind itself* in order to be comprehended; that we cannot think in determinate forms without the formation of mental images (the representative faculty) to *guide* our thoughts; and without these no concept can be formed, no reasoning is possible. Herein lies the true line of demarcation between a memorized and an understood lesson; the former is gained by mere repetition of words and phrases and does not make a

lasting impression; the latter is an analysis by the will; the intellect frames its own concepts in regard to it, and it remains; it is understood, not in the phraseology of the text book, but as a real part of the mind's work. The master who knows thus how to draw out the powers of the mind in the acquisition of knowledge is the great teacher, and is always gratefully remembered; for he has revealed to his pupil that his life's success depends upon persistence in plans that are well conceived, and purpose in all his aims.

This process of culture by the will gives largeness and stability to the intellect; all the subsidiary faculties concur to aid the great aims of the will. The *memoriter* method, on the contrary, weakens the will and, I repeat, lowers the powers of the mind.

Nothing seems to be so much neglected as the higher culture of the will in the minds of youth.

The notion that to develop a strong, healthy mental life by daily exercise in purposive thinking is not a new one in medicine. The famous Dr. Rush gave lectures, in 1802, to college classes at Princeton on physiology, and he insisted that a student should exercise his mind every day in close thought in order to give expansion and stability to its capacity: that as muscular organs are developed by activity, the brain follows the same law, and may be increased up to full limits as the material basis of the higher forms of mental activity.

What is likely to damage the brain so that the will becomes impaired, if not lost?

I have mentioned the affective faculties, the basis of which are the feelings of pleasure and pain, that accompany and play upon purely intellectual actions and which regulate greatly their scope. It is the inordinate exercise of sensibility that is especially destructive of voluntary function. Success exalts good feeling which, if unrestrained, goes on to ecstacy; while disappointment, if unrestrained, tends to melancholia; thus the exciting and depressing passions unduly developed reduce the powers of the brain by wear and tear more especially in regard to the exercise of will; and the individual becomes exposed to the dominion of his passions. To grasp, to conquer, to excel, to accumulate, to control, to "corner", to envy, to hate, to revenge, to lust, to destroy; any or all of the terrible elements of evil that dwell in the soul may arise and govern the life of a man. His reason becomes subrogated to his passions which seem like ferocious beasts, in ambuscade, ready to leap upon and destroy it.

I have only mentioned incidentally the term insanity thus far, though I have said enough to exhibit this general definition of it; that from its mildest to its grossest forms, it is a loss of voluntary power, of freedom of the will, and I again assert that the brain and its functions are under the care of the medical profession. We are able to declare that men in the management of great trusts who engage in speculation in commercial material, or those in exalted positions in the state who exhibit a vaulting ambition, become dangerous to those trusts and to society, more especially if they practice excessive indulgence in mere animal appetites or live what is called a fast life.

The stupendous ventures made in stocks and produce in the great centers of commerce are often manifestations of insanity, superinduced by the methods I have indicated. Every faculty of the mind, intellectual and emotional, is urged without restraint to the utmost limit; the operator ceases to be reasonable; he becomes impulsive, therefore uncertain and dangerous to his environment. It is impossible to truly estimate the sinister influence which a rare stroke of fortune in speculative trading will work on the mental and moral constitution of the operator. The coolest men begin usually with reasonable circumspection, but, while winning, a species of intoxication gradually creeps upon them; they sleep less soundly and, quite commonly, drink intemperately and acquire a notion of their extraordinary judgment on ventures; they think that they have discovered the law of success. At length the tide turns, they begin to lose. Then they make bolder strokes for recovery, and failing, chagrin depresses them, and excitement gives them no rest, wear and tear is rapid, the brain loses tone, self-restraint disappears, madness seizes them, and they hurl everything within their grasp, not excepting the property of others, trust funds, bank capital—all are thrown into the wild vortex of hazard and swallowed up in ruin. These things are constantly occurring. Is it depravity or insanity?

In fever, *mania a potu*, moral shocks and narcotic appetite we see, every day, reason dethroned; and, alas, under powerful excitement the vilest passions often surmount and reign over the grandest minds. The inordinate indulgence of our affective nature enervates the brain, and the disturbance of nervous force impairs the tone of the circulation in the penetralia of the organ; its pressure, rapidity and volume are disturbed, the metabolism is changed and its functional volitional capacity becomes abnormal.

We warn men, but they will not heed us. They mock at our solicitude and boast of their capacious, unlimited powers; but, sooner or later, the wear and tear shows itself; the ship steers wildly because the pilot is losing his keen eye and his firm grasp of the helm. We turn to the institutions of learning and say to the teachers, "Your overstimulation and exaction, by a multitude of tasks, will impair the usefulness of your pupils; your prize scholars shall not shine in the contests of life so well as many of their duller fellows." We warn the people against luxuriance, indolence and a constant use of stimulants, and excess of any passion or appetite; for, while many organs of mere animal function suffer, the great brain itself becomes undermined. It is appalling to contemplate the social destruction about us on account of the passions of avarice, peculation and lust which have so greatly defiled public virtue.

I turn now to a brief consideration of the insane manifestations that we so commonly encounter in our medical practice. I refer to such affections as melancholia, monomania, hypochondria, neurasthenia, hysteria, alcoholism, morphinism and hypnotism. All of these may be ranged under the insane category. They originate mostly in hereditary types of constitution, in errors of education, want of parental training and abuse of the organism by excesses of any kind. It is unnecessary on this occasion to display the clinical phenomena in these diseases, and their differentiation; they are so well known. The reciprocal relations, in a pathological point of view, of mind and body are very marked. The physical conditions are often of a serious character, and the functions of organic life become gravely involved. In the treatment of these diseases the highest capacity of a phy-

sician is required. It is not only the sufferer who appeals to our experience; but the family upon whom these calamities have fallen.

What can we do for hard drinkers and drunkards —those dreadful creatures, often full of violence, and whose homes are made terrible? They are diseased constitutionally, and have become mentally incompetent. They generally freely acknowledge their vices and will promise, and even take the most solemn oath, to cease their potations; but they find that their will power is too weak to resist the diabolical thirst; the cry of the nerves for the missing stimulant is often expressed by cruel neuralgias that overwhelm their purpose of reform. What can save them? We reply, isolation and systematic employment for a period sufficiently long to allow organic and voluntary life to reassert itself. Let it be written over the portals of the place of detention: sobriety, liberty: inebriety, isolation, labor. One to two years should be required for their detention, and when dismissed, it should be on a ticket-of-leave only.

Precisely this method should be employed for the treatment of morphinism or any other narcotic habit; and it should clearly be inculcated that though they seem to be cured of the appetite, abuses have left such a vicious constitution that the smallest amount of any of these toxics taken, will arouse the old appetites and bring them under bondage again. Total abstinence is their only safety.

Modifications of this method will apply in the treatment of melancholia, monomania, hysteria, neurasthenia and hypnotism. While such patients should not be required to employ themselves in any exhausting physical labor; yet, with as little delay as possible, they should do something that will develop voluntary activity. As Dr. Weir Mitchell has shown us, complete isolation in special hospitals, under trained nurses, is indispensable; they must be cut off absolutely from seeing every one but the physician and his nurses. No correspondence should be allowed, or flowers or tokens of affection from parents or friends. The nurses must not be sympathetic nor overattentive, nor comply with all appeals for service. The subject must be taught self-help as far as possible, and be discouraged from complaining of aches and pains; nor dwell upon past sufferings. It will not hurt the patient to become indignant, or to weep; indeed, the nurse should assure her that these outbursts are indications that her disease is abating; but the nurse should never show resentment by word or deed, but simply reply that she is carrying out the doctor's instructions in all that she is doing. These poor sufferers at first are continually wanting something done for them—a bag of hot water, or a mustard paper, or a poultice, or to smell camphor, or bathing of the face or hands with cologne. All these requests must be refused. After a time the worst cases of them will begin to grow calm and obedient, their impulsive actions will diminish, and self-control at length emerge. Then a course of treatment should be entered upon that will increase the power of voluntary activity. Massage and electricity should have been employed from the first; but there is a danger in an excessive use of both of these agencies; for if too constantly used, a habit will become established that will impair self-control. Sewing, knitting, embroidery, drawing or painting, should make up a portion of each day's duties. I have often directed a review of certain portions of the arithmetic, or geometry, and in some cases the writing of English into French or German, following the vocabularies and models in Ollendorf's grammars. All of these exercises require a positive exertion of the will, and they grow into self-possession in this way very satisfactorily. For forty years I have practiced a method of developing self-control by simply exacting a solemn promise from such patients, that they would not speak of their ailments to any one but myself. Indeed, with office clients who are suffering with milder hysteria, hypochondria and neurasthenia, it works well. I have had a large observation in this line of practice, and will say that I think that the ingenuity exercised in their successful management is greater than in most other affections. The so-called Christian science or faith cure people, get their success in this way. My limits forbid my further enlargement of this subject.

What I have desired to show is the differentiation of will and impulse—that the essential element in the perversion of intellection and emotion in all insane diseases is the abeyance of the will; that we should not say of these patients, that they have an obstinate will, but rather that their ideas are unregulated and unrestrained, and cannot be otherwise without a restoration to health of the area of the brain where consciousness exists; that to search successfully through all the hidden paths of the misty labyrinth of mental alienation, we must take as a guiding thread, that functional ill-health superinduces a lowering of consciousness and an invalidation of voluntary power. By all approved remedies we must seek to improve the general health of the body and a rational volition.

In a brief conversation I had with Prof. Charcot last summer (he was my clinical teacher many years ago), I ventured to say that I thought in the studies of the startling phenomena of hysteria and hypnotism, sufficient account of the aberration of the will had not been set forth. He replied that there were in these cases manifestations of strong will. But, I continued, the researches under your direction by Gilles de la Tourette and Cathlineau had shown that these cases were in bad health; therefore these mental phenomena were merely impulsive; that the influences of suggestion in hypnotic cases were the guiding sensations.

In a final remark let me say that this subject is largely related to cases in medical jurisprudence which involve a differentiation of insanity and depravity; also in various questions of moral irregularities, and the difference between automatic and purposive action. This whole question is too large to compress satisfactorily into a paper of thirty minutes length.

Discussion.

Dr. C. H. Hughes, St. Louis, Mo.:—I would qualify the statement of the paper that hypnotism is an absence, perversion or impairment of the will to the extent, viz.: that it is a perversion of the will dependent upon a hypnotic or sleepy state. Some of you may know that I offered a substitute term some years ago for hypnotism, which was somnavolism. This term I consider more expressive of the hypnotized state than hypnotism. Hypnotism signifies scientifically nothing except a condition of sleep, which it is not exclusively. Hypnotism is a scientific misnomer because he who is in a sleepy condition is simply in generally a drowsy condition; whereas something in the individual becomes passive in the hypnotic state. The individual becomes abeyant to the suggestions of another. Abeyance to suggestion is the phenomenon of hypnotism.

It is somnavolism. It is the normal will of the individual made obedient to another through the sleeping process. It is a partial absence of the individual's normal will through the sleep process (*somnus a volo*). It is not a psychical process induced by the influence of the operator as was taught by Mesmer and his followers, and whose term *mesmerism* was equally as good as the substitute term of *hypnotism*, both signifying a similar mental condition. I called attention to the term proposed for this condition some years ago, in the *Alienist and Neurologist*.

Dr. Comegys has given us an excellent dissertation on mental hygiene for the public. Such a paper ought to appear in the higher class magazines that the people may know the true relationship between the psychical and the physical in their mental processes. I presume every one in this Association is in accord with the sentiments of the paper, and no one is better qualified than Dr. Comegys to discuss the subject.

Dr. C. G. Comegys, Cincinnati, Ohio:—I am glad to hear such kind expressions from my friend, Dr. Hughes, on this very important subject. I do not think we can over-estimate its importance. I have a feeling, which I believe is true, that this profession of ours is the greatest in this or any other Nation. Instead of playing a subsidiary part, we have more right than most men to stand by and dictate in regard to matters pertaining to the welfare of the public, and we should exercise all the influence we can to get recognition in the State for our profession.

In looking over the proceedings of the International Congress of Hygiene and Demography, which met in London last year, and noticing the welcome extended there to the French, German, Italian and Austrian scientists, I regretted to note that there were only two or three men to represent this great Republic of sixty-four millions of people. There was a distinguished gentleman from Minnesota and Dr. Vaughan, an eminent man, from the University of Michigan, but they did not officially represent our country; they were not asked to say anything.

Sir Joseph Fayrer, President of the Congress, and one of the most distinguished men in Great Britain, declared that though they had accomplished much work in England through the Local Board, a sort of national medical board in London, where Simon, Burdon-Sanderson and Klein have labored successfully, there is no telling what could have been accomplished if they had had a medical minister of the State.

NOTE ON THE HYSTERICAL CONCOMITANTS OF ORGANIC NERVOUS DISEASE.

Read in the Section of Neurology and Medical Jurisprudence, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY C. H. HUGHES, M.D.,
OF ST. LOUIS, MO.

The conclusion, "Some hysteria, *ergo* all hysteria," is a clinical conclusion which has proven in numberless instances fatal to correct diagnosis and to the welfare of many patients.

This neurosis may be latent as any other inherent tendency to neuropathic instability may be and often is, until some psychical or pathological cause calls it into morbid activity. While hysteria is essentially an imitative and functional disturbance of the psychomotor, sensory and ganglionic centers, it is no more unreasonable to expect its development in conjunction with grave organic lesions of the cord or brain, than to anticipate pain or spasm from profound central disease or even from multiple neuritis of the motor nerves extending to the cord centers or involving contiguous peripheral sensory nerve fibers.

The time has fully come, in the progress of neural pathology and clinical neurology, to recognize this fact and realize its true significance in our clinical judgments, for without such proper recognition we may be too often led astray in diagnosis and prognosis for our patient's welfare or our professional reputations before a scrutinizing and discerning public.

Hysterical patients are prone to develop peculiar inherent neuropathic characteristics of their organism under physical as well as psychical stress, and this physical strain may be a real central or peripheral structural disease.

It has been quite a number of years since the writer first began to think in this way, and ample observation has confirmed the correctness of his earlier judgments, though not until after some serious clinical errors had been recognized after the issue had been determined post-mortem.

So far back as 1867-8 and 9, 80 and 81, several of my autopsies at the Fulton Asylum for the Insane on patients who had died of organic diseases of the brain and other organs, some of whom had been pronounced only hysterical in the communities from which they came, and one or two of whom had hysterical seizures while they lived in the institution, set the author to thinking on this subject, and led to a final revision of his previously entertained view that hysteria was always a functional nervous disease invariably only associated with functional nerve trouble.

It was not long after leaving the asylum that a very markedly instructive case, because of its tragic ending, fell under our observation.

The case was that of a lady past the menopause, and mother of several grown children, who suffered from disseminated sclerosis, with characteristic pupillary changes, intention tremors and insomnia, and with numerous hysterical symptoms and frequent paroxysms.

Her case had been pronounced by old and experienced physicians to be hysteria and hypochondria (which latter, by the way, is another much misapplied term because it, too, does really, though less frequently, co-exist with grave physical lesion).

A multiple neuritis co-existed in this case and she had exacerbations of neuralgic pains.

This woman really suffered physical agony, but the verdict of her family physician and a consultant from the city, that the case was hysteria, lost her the sympathy of her husband and children which she deserved and craved, and in her despair, chagrin and grief, she took her life.

Thos. Buzzard, in his presidential address before the London Neurological Society in January, 1890, has caught a glimpse of our subject in a little different light. The essay as since published by Churchhill, of London, is entitled, "The Simulation of Hysteria by Organic Disease of the Nervous System." In this little brochure the fact has not escaped this able clinician's observation that hysterical symptoms may co-exist, even with so grave an organic disease as disseminated sclerosis, but he thinks it is the sclerosis which causes symptoms which simulate hysteria, whereas we think the hysteria is real, and the sclerosis is the *casus mali* that brings into prominent morbid activity the latent functional neurosis.

He even makes certain hysterical symptoms a necessary part of the organic disease he is discussing. We quote—"It appears to me reasonable to conclude that many symptoms which have come to be considered characteristic of hysteria will, if examined in the light of improved knowledge and experience, be relegated to disseminated sclerosis. The figure of hysteria shrinks in proportion as the

various forms of organic disease acquire greater solidity and sharper definition."

But we have not always found this to be strictly true, except as the fatal ending of disease approaches, and we have in view one instance in a male which though death is impending from probable syphilitic arteritis and gummata with cerebral congestion the patient has numerous crying spells with spitting out of food and medicine, and violent tendencies at times followed by laughter and tranquility. The congestion of brain is evidently a malarial complication with cold stage, fever and sweating, reaction and intervening better days.

Buzzard's book is good reading *a propos* of our subject and bearing in mind the difference of view, viz., that in our opinion the hysterical symptoms are always brought to the surface in persons who have this neuropathic diathesis and in no others by the irritation of an organic disease, while Buzzard regards the hysterical symptoms as necessary signs of the organic disease. He has found hysterical symptoms in Friedreich's ataxia and secondary cancer. We have one of the latter cases now under treatment or rather as a sequence to a second removal, the patient having, also, been really insane with delusions of electricity, etc., and periodicity of exacerbation as of malarial poisoning.

He details a case of hysterical paraplegia dependent on atrophy of the ilio-psoas muscle, and a number of cases of disseminated sclerosis mistakenly diagnosed as hysterical, one of them in a male patient and one case like our own terminating fatally.

We remember to have seen one case of posterior sclerosis in a female, in which the pharyngo-laryngeal crises were so distinctly intermittent and the sensation of globus was so like that of hysteria that we were often uncertain as to whether the patient did not really have the true globus hystericus from the irritation of the changes in the pons and medulla and the reflected gastric crisis. She had other hysterical symptoms, and had in her earlier life been a victim of this neurosis spasmodica. She died, however, in a cardio-laryngeal crisis.

In the recent publication of the Salpetriere Cliniques,[1] Volume, 1, 1872, Charcot relates a case of Morvan's disease complicated with hysteria and several cases of hysterical tremblings having associated variations of intention tremor and vibratory tremor. These were probably, as they were apparently, associated with sclerosis.

Five days ago a lady, now dead of cerebral congestion, came to my office at the instance of Dr. Mayger of this city, with general hysterical trembling. Her history had been one of mental shock and over nerve strain.

I have seen a case of abscess of the cerebrum following a cerebritis preceded by hysterical symptoms till near the close, and a school teacher of 22 years overworked and anxious about her ability to continue teaching developed hysteria along with general neurasthenia and malarial poisoning, the latter ending in cerebral congestion, temporary insanity and death, the hysterical symptoms disappearing as the gravity of the cerebral disease increased.

[1] Clinique des Maladies du Systeme Nerveux, M. le Professeur Charcot, pendant les annees, 1889-90 et 1890-91, sous la direction de Georges Guinon Chef de Clinique. Publications du Progres Medical.
"Relation d'un cas type de maladie de Morvan complique d'hysterie. Superposition des anesthesies hysteriques et de Morvan chez le meme individu".

Hysteria sometimes displays itself in connection with epilepsia mitior as well as in the grave form of hystero-epilepsia. It has been developed in my observation after diphtheria, scarlatina and rheumatism. In these instances I have always found a family history of this or other form of spasmodic neurosis. It is not uncommon in ordinary chorea, especially later in life after an earlier chorea; one of my present cases of chorea major shows hysteria markedly. But these are both ordinary functional nervous diseases.

I think I have seen it in one instance brought out during the convalescence from hemiplegia as chorea sometimes appears.

With these clinical facts before us, are we not justified in extending our search for hitherto unsuspected organic disease of the nervous system as causes of hysterical symptoms, as well as in looking to the womb for the fountain source of this symptomatic neurosis and in relegating to the back-ground the prevailing clinical dictum that, "Where hysterical symptoms present, the trouble is only a functional one of the nervous system?

It is undoubtedly true, as Buzzard has clearly shown, that hysterical symptoms develop *de novo* only in part and as part of the expression of organic nervous disease. I have seen such cases—cases where the mind was for quite awhile in doubt as to the real nature of the disease—whether organic or functional. As one may see paralysis appear and find the cincture feeling present and the knee jerks absent in hysteria sometimes, so may he see symptoms of hysteria in real organic disease. I may note here a case of salam tremor or rhythmical contractions of the sterno-mastoids, long suspected by myself to have been hysterical, which proved to have been caused by cervical pachymeningitis of which the patient subsequently died.

As this is but a note of clinical warning we trust this word may prove sufficient to the wise clinician and with a brief quotation slightly qualified to compass our own view we close this paper as Buzzard has introduced his able address, our object being "to draw attention to the frequency with which symptoms liable to be looked upon as (solely) hysterical are found to be really due to structural changes in the nervous system" as the exciting if not solely causative factor.

Discussion.

Dr. J. G. Kiernan, Chicago, Ill.:—It seems to me in addition to the point raised by Dr. Hughes, that there is another point that it will be well for us to consider. There is a very popular notion that hysteria is a purely imaginary condition. But there is a growing tendency to look on hysteria as an expression in many instances of congenital defect the result of a teratological condition in a woman; so far as clinical phenomena are concerned, due to instability secondary to that teratological condition. Of course, it may be acquired, and the natural corollary would be that it can be simulated by almost any of the organic neuroses.

A little over nineteen years ago I reported a couple of autopsies in which secondary hysterical paraplegias, spinal changes, were found which were considered secondary to hysteria; in other words, it was an ascending condition. It is fair to assume that it may have originated in such a condition. The repeated exhaustion of the nerve symptoms by the hysterical condition has resulted in a pathological change in the center with a direct organic condition as a result of that.

Dr. Archibald Church, Chicago, Ill.:—It is with extreme satisfaction that I have heard the paper of Dr. Hughes on this important subject. He has sounded a note of warning, which seems to me has been long needed in the general pro-

fession. We know there is a general tendency on the part of the average medical man just as soon as he encounters well marked symptoms of hysteria to attribute every manifestation of disease in that particular individual to hysteria without further investigation.

I have read the little book of Buzzard with a great deal of interest, and I feel with Dr. Hughes that he has gone too far in attributing to hysteria the importance he has in relation to organic nervous disease. On the other hand, I feel that Dr. Hughes has gone a little too far in attributing the position he has assigned to hysteria in his article. The main point to remember is that hysteria may be followed by organic nervous disease; and that a person with organic nervous disease is not therefore exempt from hysteria, but rather is the more likely to be subject to it.

I am glad Dr. Kiernan referred to some of these French cases in which organic changes have been found and attributed to hysteria. For instance, hysterical contraction has been noted and assigned to hysteria, and after many years changes were found in the cord and attributed to hysteria.

If these cases were more thoroughly studied, I think we should find organic disease of an ascending character upon which hysteria had been engrafted or which had occurred in hysterical individuals.

I trust the paper of Dr. Hughes will be widely read, as it will point out to the practitioner that every hysterical case demands as careful attention to possible organic changes as if hysteria were not present or suspected.

Dr. James Taylor, London, Eng.:—I was very much instructed and interested in the short paper of Dr. Hughes, from the fact perhaps that I knew Dr. Buzzard was collecting material for his book, which he afterwards utilized in a paper read before the London Neurological Society.

I have watched a good many cases similar to those reported by Dr. Buzzard, and had an opportunity of examining some of them post-mortem. As I understood him, ascending sclerosis was the disease he considered chiefly in reference to hysterical manifestations, with the other manifestations of organic disease; that in disseminated sclerosis there are a great many hysterical symptoms, and these may serve to us as danger signals, not by any means to be neglected or passed over; that in such profound disturbance of the nervous system as occurs in a disease like ascending sclerosis, any underlying instability of the nervous system, which is usually manifested in so-called hysterical phenomena, is liable to be present. In that sense the hysterical symptoms are manifestations of organic disease. Of course, every disease, strictly considered, is functional in its manifestations. Although we know there is now a line of organic change in the nervous system, still the symptoms of disseminated sclerosis are manifestations of disturbed function. I think in order to be on the right road in the whole matter, we shall have to get a definition, which I admit is a very difficult thing to do, of hysteria on the one hand, and organic disease on the other. Do we know that there is such a disease as hysteria at all; that is to say, a purely functional disturbance of the nervous system without some underlying organic change? The change may not be manifest to our methods. There may be chemical changes. Of course, we know that a certain class of symptoms are classed under the convenient term of hysteria, but we have no accurate definition. And while I say at Queen's Square our attention has been directed to the so-called hysterical manifestations of disseminated sclerosis, I do not think that the hysterical manifestations are by any means confined to that.

I think Dr. Hughes is to be congratulated on the extremely able and vigorous way in which he has brought the subject before the Section. Through the kindness of your Chairman I am here with you, and I am extremely gratified to have been here this afternoon to listen to the able paper which Dr. Hughes has read. (Applause.)

Dr. L. Bremer, St. Louis, Mo.:—I wish to state that the paper which Dr. Hughes has read is in perfect harmony with the modern tendency of neurology—that is to say, the "weeding out" process of the neuroses. When we say that such and such a disease is a neurosis, as a rule we thereby acknowledge that we are ignorant of the true nature of the disease. The trend of medical progress, and of neuropathology in particular, is to find the anatomical substratum of the disease and the pathological factors. This has been done and is still being done in a great many of the manifestations of the nervous system which we comprehend under the name of hysteria, and which has been alluded to by the preceding speaker as a rather vague and meaningless term. I can add my testimony to the observations that have been made as to the utmost difficulty when symptoms obtain in the perplexion of diagnosis, especially in the earlier stages of insular sclerosis and hysteria. I have observed for a number of years cases such as have been reported, and had I not known that these investigations were going on, and observations had been made previous to 1890 that insular sclerosis sometimes does mimic hysteria, my attention would not have been called at so early a date to the possibility of the anatomical lesion which afterwards developed in this case. I wish to call the attention of this body to another fact which perhaps is not quite sufficiently insisted upon, and that is, like epilepsy, hysteria sometimes marks the prodroma or initial stage of infectious diseases. I have observed hysterical attacks in some cases of la grippe during the last two epidemics we have passed through, and one case especially, that occurred at the St. Louis Hospital, had all the phases of grand hysteria as Charcôt describes them. Every physician that saw the case and that had a knowledge of the hysterical attacks and had seen them before, pronounced it a case of true grand hysteria, the various phases being well marked. Nobody thought of la grippe at that time. When I made a post-mortem examination I found an influenza pneumonia complicated with basilar meningitis. There was also a cribriform state in the pons. This state had been produced by the pneumococcus of Friedlander, an organism which develops in a culture medium as well as in the blood and in the tissues of the body a gas which is to a great extent hydrogen. The meningitis, together with the cribriform state of the pons (in one place this looked like worm-eaten, and in the cavities the pneumo-bacilli were present in large numbers, together with amyloid corpuscles) must here be looked upon as the causes leading to symptoms resembling hysterical attacks.

I have alluded to this case for the purpose of proclaiming myself in harmony with the modern view of eliminating the neuroses, and of showing that in a great many of those cases that were formerly looked upon as purely functional, there is after all a well marked anatomical substratum.

Dr. W. J. Herman, Ann Arbor, Michigan:—One remark made by Dr. Bremer calls to my mind a thought that has not infrequently been suggested to me, as I have had an opportunity to study some of these cases with hysterical manifestations, and also to make post-mortem examinations in some cases of disseminated sclerosis. I have noticed in some cases of disseminated sclerosis in which I have subsequently made an investigation post-mortem, that certain patches of sclerosis were present in the pons. From the frequent association of the hysterical symptoms with those cases in which the lesions were largely in the pons, the thought has been suggested to my mind that possibly it is in this portion of the brain that a disturbance of metabolism or disturbance of circulation, or whatever it may be, must be set up and serve as an anatomical or physiological substratum upon which hysterical manifestations depend. This was further impressed upon my mind by the study of a case in the University hospital some two years ago, which was first thought to be a case of pure hysteria. The physician through whose hands it passed so recorded it, and the emotional manifestations were at first the prominent ones; but at the time the case came into the hospital there was evidence of gross lesion, and the patient was not long in the hospital before death ensued. We found a parasitic growth at the base of the brain of considerable size. It was on the right side of the pons. In this case the hysterical symptoms were at one time very prominent, and the case points in my mind to this portion of the brain as being possibly the region from which hysterical manifestations may arise. Possibly in the early stages the disturbance of circulation, alone occasioned by such lesion might account for the hysterical symptoms.

Dr. J. J. M. Angear, Chicago, Illinois:—A case somewhat germane and perhaps broadening the views that have been entertained came under my observation some years ago. It was a lady patient who had all the manifestations of uterine trouble. She had the peculiar mental condition and a great many of the nervous symptoms common to patients suffering from uterine disease, and upon examination I discovered hyperæmia, an irritable condition of the mucous membrane of the os and cervix uteri. I congratulated myself upon the examination that I had diagnosed the case correctly, treating her in the usual way with sedatives, astringents, etc. She apparently improved for a while with this treatment, but greatly to my surprise in a few weeks she died of apoplexy. Upon post-mortem examination we found the posterior part of the anterior lobe literally "plowed up," as Watson says, showing that my diagnosis was correct only in part, the brain trouble entirely over-

looked. There was organic difficulty going on in the brain, and these manifestations which we attributed to the irritable condition of the uterus must not be relied upon too confidently, remembering that an irritable and congested condition of mucous membranes are symptoms of nervous and brain troubles.

Dr. C. H. Hughes, St. Louis, Missouri:—I think Dr. Church did not quite catch my view in regard to Dr. Buzzard. Dr. Buzzard speaks of the development of hysterical symptoms as a part and parcel of certain nervous diseases, especially disseminated sclerosis. He speaks of certain hysterical symptoms as a part of the symptom-grouping of disseminated sclerosis.

The points I make in this paper were not made in the book written by Dr. Buzzard. The substance of my paper was prepared by me years ago. I presented a case before the St. Louis Medical Society, in which the symptoms were markedly hysterical and so regarded by other physicians. She finally died with an abscess at the base of the brain. Dr. Buzzard takes no account, in his book, of the latency of hysteria as a neurosis brought into activity by a superimposed organic nervous disease. From the nature of disseminated sclerosis, we know very well that its *foci* may be so distributed as to act as sources of irritation, and my view of these cases is that it does act as such in bringing into activity the latent neuropathic tendency, and these symptoms appear in no other patients than the inherently hysterical. They do not appear *de novo* in persons who do not possess the neurosis spasmodica. I believe accumulating clinical experience will confirm this statement. In all of these cases there will be found I think, a family history of the neuropathic diathesis.

The first case that attracted my attention outside of an asylum was in 1872. My first observed case of disseminated sclerosis with hysterical symptoms was pronounced hysterical only in 1872 by a distinguished physician, of St. Louis, and other physicians in the patient's neighborhood. It was sclerosis associated with hysterical manifestations. Hysteria is frequently associated with disseminated sclerosis. I believe it is a safe thing to suspect the beginning of sclerosis in patients with hysterical symptoms who also have lowered reflexes or impairment of them and rhythmical movement or intention tremor.

DISORDERS OF PANTOMIME OCCURRING AMONG APHASICS, STUDIED PARTICULARLY WITH REFERENCE TO THEIR MEDICO-LEGAL BEARINGS.

Read in the Section of Neurology and Medical Jurisprudence, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June 8, 1892.

BY CHAS. K. MILLS, M.D.,
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[ABSTRACT.]

Pantomime is the representation of ideas by action and movement; it is an intellectual act; according to Hughlings Jackson, it differs from gesticulation as a proposition does from an oath, although the terms gesture and pantomime are frequently used almost interchangeably. Amimia and paramimia are terms which have a corresponding import, as regards pantomime, to aphasia, paraphasia, paralexia, etc., with reference to speech. We may have a jargon of signs and motions, as well as of words and sounds; we may have a sensory or receptive, and a motor or emissive amimia; sensory amimia is in fact a form of apraxia. Pantomimic disorders may be mixed, combined, or associated; we may have all blendings of them just as we have of ordinary speech disturbances. A study of the losses and disorders of pantomime will often be of great assistance to the physician in diagnosis; and in some medico-legal cases decision will largely hinge upon the consideration of the presence, absence, or disturbance of intelligent pantomime. Different and conflicting interpretations are too often given to the pantomime observed among aphasics; every case of aphasia should be studied for itself as to pantomime.

In nine cases of aphasia or pseudo-aphasia which were investigated, notable differences and peculiarities in pantomime were presented by the patients.

In one case of brachio-crural monoplegia, almost complete motor aphasia with marked preservation of pantomime were present; in a hemiplegic with convulsions, word-blindness, verbal amnesia, and motor aphasia, there were marked sensori-motor disturbances of pantomime; in a third case, one of right hemiplegia, nearly complete aphasia chiefly of the motor type, the pantomime was varied and uncertain; a fourth case was one of right hemiplegia with marked contractures, complete aphasia of the mixed type with a single recurring utterance, and almost complete amimia; a fifth was a case of right hemiplegia, paralysis of the face, almost total abolition of pantomime, with almost total sensori-motor aphasia, and obstinacy and energetic emotional gesticulation. In a sixth case of marked hemiplegia of gradual development with motor aphasia and anarthria, only a slight degree of loss of pantomime was shown, while case seven, one of right-sided pseudo-bulbar paralysis with anarthria and preservation of writing ability with the left hand, exhibited also full preservation of pantomime. Case eight, was an example of right-sided pseudo-bulbar paralysis and ophthalmoplegia, with anarthria, marked oro-lingual paresis, and full preservation of pantomime, but with considerable mental apathy. The ninth and last case recorded was one of double hemiplegia from successive lesions on the right and the left side of the brain, with absolute abolition of speech and pantomime.

The study of pantomime may become an important diagnostic aid in the fixing sub-cortical lesions, and particularly the position of a sub-cortical lesion with reference to its distance from the cortex. Some of the cases detailed showed that when the lesion was entirely in the straits between the ganglia, the corona radiata escaping, pantomime was either not lost or was soon entirely regained. The speech defect is of the nature of an anarthria or pseudo-bulbar affection, and a diagnostic point is the ability of such patients to throw even into the paralyzed members some volition.

Marked differences in the disorders of pantomime will be found in cases of paralysis and of motor or mixed aphasia which are apparently identical, or at least, very similar in character, which identity or close similarity, however, will often be found to be apparent rather than real; for investigations will show in many cases differences in the degree and character of the motor paralysis, sensory symptoms, and aphasia, which are sufficient to separate the pantomimic disorders into classes.

The medico-legal investigator, even without any appreciation of the nature, extent, and location of the lesions, would recognize important differences between these patients—difference both in speech and pantomime which make it essential for just decisions to carefully study both.

The "yes" and "no" of an aphasic are well known to have very diverse degrees of value. One of these two words may be used to express both assent and dissent; or with its proper meaning; or to express assent when dissent is ment; or simply as an emo-

tional, interjectional, or accidental expression. In like manner, the usual pantomimic method of expressing assent by the forward nod or bowing of the head, and of indicating dissent by shakes or half rotations of the head, or any other movements apparently meaning "yes" or "no," will be found in aphasies to have as many interpretations as the articulated "yes" and "no."

Great care should be taken not to misinterpret the emotional manifestations of an aphasic. The gestures and appearances of the face indicative of displeasure, anger, obstinacy, and irritability, etc., are often strongly suggestive of dissent; while on the other hand those which merely indicate pleasure, amusement, or playfulness, may sometimes be mistaken for assent or accord—facts which the last two cases particularly illustrate.

True amimia is an intellectual disorder just as is true speechlessness. It may be correct to say that emotional language is apparently unaffected in aphasics; but it would not be correct to say that it is entirely unaffected. The expression of the emotions while frequently correct, sometimes energetic, and often violent, is in serious cases of disturbance of intellectual pantomime, not uniform and under control. In many normal individual emotional manifestations may be instantly controlled at any stage, and in accordance with varying inhibitory powers in different individuals, weeping can be turned to laughing; a smile to a frown; the sounds of lamentation to those of rejoicing, by the trained and skilful actor, and in varying degree this power of control is preserved by all normal individuals. In aphasics with serious disturbances of pantomime, the losses shown in the emotional side are seen in meaningless continuations or repetitions, by slow transitions, and undue excitement.

Discussion.

Dr. J. G. Kiernan, Chicago, Ill.:—It is well known that paretic dementia is by no means a bad state to test a good many conditions. There are phenomena which I and a number of others have noticed in the paretic pantomime element. The facial expression may be that of depression, while the general state of the mind is exaltation, and of course *vice versa*. This factor in dealing with pantomime should be taken into consideration. Many aphasics do not retain their mental organization in its entirety. Their intuitions are weak and in the place of one conception inhibiting the other, both come into play, and we have alternation, and at times certain ideas of a directly opposite character are produced from a suggestion. The uncertainty resulting from this condition may produce uncertainty in the pantomime. It has been shown by two or three English writers that in secondary confusional lunatics of the incoherent type, a little attention to certain lines of speech will produce seeming coherence which is a species of reflex intellection, the product of suggestion, and automaton-like.

Dr. Archibald Church, Chicago, Ill.:—Much as aphasia has been studied, I feel that Dr. Mills has introduced us to an entirely new phase of the subject, which we can all follow up with interest and advantage in our own cases. Gesture and pantomime are acquired by a child only after the speech faculty is well developed, and one might expect *a priori* that this complex addition to thought expression would be readily implicated. A case of meningitis recently under observation was followed by complete agraphia and alexia, and when the patient finally got on to his legs, it was found that the power to walk was lost, though station was firm even with closed eyes. There was locomotor amnesia, if I may use such a term, a complete loss of a group of coordinate and continued lower extremity movements corresponding somewhat to the arm difficulty of Dr. Mills' patients. All other movements could be executed with precision and promptness when the patient was in a chair or in bed. In this instance the implication of the medulla as shown by respiratory and cardiac symptoms and sugar in the urine, of the visual area by the alexia and agraphia, leads me to think that the inflammatory process next involved the leg centers in part, by extension upwards along the middle line. The localized pain in the occipital region may also add strength to the supposition. With convalescence the patient learned again to walk, first stepping forward with one foot and bringing up the other, and the aphasia also passed away in the course of a few months.

Personally I desire to express my appreciation of Dr. Mills' instructive paper.

Dr. J. J. M. Angear, Chicago, Ill.:—There is nothing to criticise in the admirable papers of Dr. Mills, but perhaps we might broaden the circle a little in some of these abnormal, or rather we might call them normal, aphasias peculiar to certain individuals. Some individuals seem to be congenitally defective of word sight. Give them a book and ask them to commit a certain thing to memory, they are not able to do so in quiet, but if they can go outdoors or into a room by themselves and commence reading out loud as if reading to an audience, they will soon commit it to memory, showing that they want the sound and not the sight of the words. I knew a gentleman of scholastic attainments that lived to a good old age, who never attempted to read anything in public, unless he had an opportunity of sitting down and apparently studying it. He would then be able to get up and read and no one would ever be the wiser for it. Some never make good readers—forever miscalling words and going back and correcting themselves. Again, by watching closely you will find our good readers can look almost a line ahead in reading, showing that they have very good word sight; while if you inquire of those whom we call poor readers and who have a hesitating style of reading, they simply read word by word as they go along, never looking far enough ahead for the next word, showing that they have very poor word sight. If you give some young men a written examination they make a failure of it; whereas if you make it oral they are successful. You take the same individual and talk with him, and you will find that he is pretty well posted. Very few of our scholars—learned men—become writers. We have other illustrations. We have fine writers of scientific works, of literary works and of fiction—men who cannot get up here and talk five minutes. Words fail them. Give these same men a pen, the choicest words and sublime thoughts come. Their tongues are weak but their pens are mighty. I take it that this is something in the line of aphasia. With reference to pantomime you will notice some individuals in speaking, without any special training in this direction, their gestures give great force to what they say, because there is a meaning in them; in other words, they are appropriate; while others are eternally making gestures that are decidedly inappropriate and awkward, showing that pantomime is very defective in their case.

Dr. William Fuller, Grand Rapids, Mich.:—I wish to say that I have in my possession the cast of a brain in which the first temporal convolution is almost entirely wanting, while the second convolution is very highly developed. This man could remember nothing that was told to him and was generally supposed to be an imbecile. He was a frequent attendant at operas, theatres and all places of entertainment. He went about the city continually humming tunes to himself without using words. He was a man that after hearing a tune once took it in and never forgot it. He very seldom talked to anyone and then only a few words, The occipital lobes in the cast show a very high development as well also does the frontal part of the brain.

Dr. A. D. Rockwell, New York City:—In common with others I have seen various forms of aphasia, but a short time ago a case came under my observation, which although not altogether unknown is certainly of rare occurrence. I allude to what Kusmaul has termed "word blindness," or inability to comprehend visual word symbols. A gentleman, aged about 60, who had suffered from a slight attack of hemiplegia, had no defect in speech, but if he attempted to read either to himself or aloud—which he could do only with difficulty—the printed page conveyed absolutely no meaning to his mind.

This condition, which is termed also "alexia," is quite different from the simple inability to read aloud—cases of which are not infrequent. These cases of motor aphasia are specially interesting from the fact that sometimes they are only transient, but in this case the lesion was of a character that rendered the loss permanent and the patient succumbed to a second and more severe attack.

Dr. H. B. Hemenway, Evanston, Ill.:—I want to call attention to one point which seems to me to be very import-

ant, and that is the differentiation between true aphasia and the matter of education. It seems to me that Dr. Angear in his remarks has confused the lack of education with a diseased condition. As I understand it, aphasia is a diseased condition. Of course, a man may understand nothing of what we say for the simple reason that he has never been educated.

An Indian who has never learned our language, could not understand our conversation. In a like manner, a foreigner may be able to read English easily, but understand the spoken words slowly, or not at all. There is, as Dr. Angear has said, a great deal of difference between students. One student may pass a good oral examination, but not a good written one, for the simple reason that his preliminary education has been neglected. That is not a diseased condition, but it shows the lack of development. There are undoubtedly persons who have natural gifts in certain directions. These gifts are often the result of hereditary training, or education. It seems to me that pantomime is often the result of hereditary influences. I say hereditary because some nationalities exhibit the power far stronger than others. There are others, who on account of loss of speech, or of occupation are obliged to use pantomime. This power is the result of training, and compared with such persons an individual may be greatly lacking, and not be at all diseased.

Dr. L. Bremer, St. Louis, Mo.:—It is a fact that there are cases of pantomime without aphasia, and that in these cases localized lesions have been found in the inferior optic thalamus. I do not wish to enter into a lengthy discussion of this paper, but I simply wish to say that it has always seemed to me that in cases of aphasia there is some degree of mental weakness always present. When the subject was discussed in France in the early days of the aphasia question many held that the greater the aphasia the greater the mental defect.

Dr. C. H. Hughes, St. Louis, Missouri:—I hardly think that the statement, the greater the aphasia the greater the intellectual lesion, should be permitted to pass entirely unchallenged, as very much depends upon the condition which may have precipitated the aphasia. I do not see, when we are called upon to testify in court, how we can take the ground that a distinctively traumatic condition causing aphasia must necessarily produce mental impairment. It is true in the beginning of the aphasic attack where the cerebrum is largely implicated from the œdema which immediately follows an attack, that we find a large amount of concomitant mental enfeeblement, but as recovery reasserts itself, we find that nothing appears to remain in some of these cases, so far as my observation goes, but the simple fact of the aphasic lesion. I think we ought to be a little careful about promulgating a view upon this subject that will embarrass us before the courts. I believe that where persons have aphasia, from a circumscribed lesion that is traumatic or a lesion which is simply one involving the organ in sudden closure, we may have a purely local and limited aphasic lesion the result of adventitious change, or syphilitic cerebritis or embolus involving the middle cerebral artery, which of course would not in the nature of things be distinctively limited to the posterior aspect of the third left frontal convolution. While it is in the main correct to state that there is usually and in the beginning of the attack something more than the circumscribed mechanical embarrassment producing the aphasia, at the same time I believe there can be no doubt about the fact that there is such a thing as aphasia which is limited to the third left frontal convolution, the result of direct and limited local mechanical embarrassment, whether it be the depression of spicula of bone which is removable, the obstruction of an embolus or a lodged thrombus, leaving finally only aphasia without other mental failure; nevertheless, as a general rule the proposition is correct that you have accompanying enfeeblement, especially in the earlier stages of the disease, but the patient may recover from all but the speech failure.

Dr. C. K. Mills, Philadelphia, Pennsylvania:—Although the discussion has wandered a little sometimes from the particular matter of pantomime, I am gratified at the turns it has taken, as in nearly every case some point has been brought out bearing on this subject.

The q iestion of the preservation or loss of pantomime in various forms of insanity, alluded to by Dr. Kiernan, is of great importance.

The remarks of Dr. Angear were interesting as emphasizing points which I did not emphasize enough. It is important, as remarked by Dr. Hemenway, in considering pantomime or any allied subject, to take into account in our studies not only the diseased state and the symptoms which are expressive of it, but also the original capacity of the individual, and his development or lack of development. Take, for example,the cases on which this paper was largely founded, cases which I have studied in the Philadelphia Hospital; many of them are persons of limited education, and have had no special manual, of other training of a higher sort; these facts must be weighed in discussing aphasic or mimic disorders. An actor or an orator, one who has his powers of pantomime highly developed, and one who has a good inheritance and original capacity, may recover speech and pantomime sooner or more fully than others.

With reference to the question discussed by Drs. Bremer and Hughes of aphasia and mental impairment, the gist of my paper would be largely to emphasize that which was emphasized yesterday in another connection, while we have all grades of mental loss in a theoretical sense, still practically it is necessary for us to study these cases as they present themselves. Pantomime, like defect in speech, is recovered from in varying degrees in the progress of a case of organic brain lesion. This point is one of great importance medico-legally, and should be borne in mind.

FUNCTIONS OF THE CORD.—In the summer number of *Brain* Dr. Mott gives the result of observations and experiments he has made with the view of discovering the relations and functions of especially the ascending antero-lateral tract, commonly known as Gowers's tract in the spinal cord. In summarizing his results he states that the peripheral portion of the anterior and lateral columns consists in great part of ascending and descending cerebellar fibres. The former, the ascending, may be divided into a ventral and dorsal portion, and these should be named the ventral and dorsal ascending cerebellar tract instead of the antero-lateral and direct cerebellar tracts, the latter being the names by which they are now generally known. The ventral portion, it is said, may be completely divided in monkeys apparently without producing analgesia. The ascending cerebellar tract, he says, forms a connecting bridge between the superior vermis of the cerebellum and cells in the cord, the dorsal portion connecting the cells of Clarke's column with the dorsal part of the superior vermis, while the ventral portion connects certain cells of the cord with the ventral part of the superior vermis. Section of the antero-lateral column was found to produce much denser degeneration amidst the areiform fibres than could be accounted for by the slight injury to the direct cerebellar fibres. The extensive tract of degeneration corresponding to Gower's antero-lateral tract (which he thinks, with Löwenthal, should be called ventral cerebellar) has been traced in the monkey to the superior vermis by way of the superior cerebellar peduncle, forming in its course a curious loop over the fifth nerve.—*The Lancet.*

THERAPEUTIC APPLICATION OF DIURETIN IN CHILDHOOD.—Dr. Demme has given this substance to eleven children suffering from various forms of dropsy. He finds diuretin applicable in childhood from the end of the first year, a valuable diuretic and free from injurious action. The diuretic effect appears to be due to its action on the epithelium of the kidneys. The at times excessive dropsy of scarlet fever nephritis appears, after the expiration of the first acute stage of the nephritis,to be more quickly overcome by diuretin than by any other treatment. Dropsy from mitral insufficiency can generally, after compensation of the latter by digitalis, be quickly cured. The daily dose for a child two to five years old is 0.5–1.5 grams, from six to ten, 1.5–3.0 grams of diuretin best taken in 100 grams of water with the addition or ten drops of cognac and 2.5 grams of sugar. No cumulative action has been observed nor weakening of the therapeutic effect after several weeks' use.

SALOL IN CHOLERA.—The treatment for cholera proposed by Dr. Lœwenthal (first dose of two grams followed by hourly or half-hourly doses of one-half to one gram of salol), after experimenting with it in the laboratory and on animals, has been used on human beings with remarkable results. Dr. Gonzales, of Salvador, has used this treatment in 53 cases of cholera in one of the Philippine Islands with only three deaths (and these were already in the last stages of the disease when they came to treatment). The mortality under other modes of treatment is about 45 per cent.

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SATURDAY, SEPTEMBER 17, 1892.

DENTITION IN INFANTS.

A communication from the pen of H. C. WOOD, upholding gum lancing, and taking issue with the views of FORCHHEIMER, on the subject, as detailed in his recent book on the Diseases of the Mouth, has been copied very generally by the medical press of the country. This extensive republication may fairly be taken as expressive of a general approval of the position taken by PROF. WOOD.

Upon the questions of difficult dentition and gum lancing, the medical world has been for some years divided; the smaller party taking the modern view that dentition is a normal process and rarely if ever produces dangerous symptoms; the larger party holding that dentition is responsible for most of the ills that infants suffer from, and that gum lancing is its sovereign remedy. This latter view is one of our most ancient possessions, having come down to us from HIPPOCRATES. For centuries it remained unquestioned, and has consequently become firmly intrenched in both the professional and the lay mind.

JOHN HUNTER ascribed the following conditions to dentition: "Diarrhœa, costiveness, loss of appetite, eruptions on the skin, especially on the face and scalp, cough, shortness of breath, with a kind of convulsed respiration, and similar to that observed in whooping cough, spasms of particular parts either by intervals or continued, and increased and sometimes decreased secretion of urine, a discharge of matter from the penis, with difficulty in micturition, resembling symptoms of gonorrhœa in its violent form. The lymphatic glands are apt to swell at this time; if the child has a strong tendency to scrofula, this irritation will promote the disease. There may be many other symptoms with which we are not at all acquainted, the patients not being able to express their feelings."

Most, if not all of these symptoms are attributed to teething to-day.

Perhaps the earliest opposition to these views was by ROSEN VON ROSENSTEIN, in the middle of the last century; but his opposition was only partial. But WICHMANN in 1800 expressed the true status of dentition when he said: "It is to be hoped that, in the future, dentition will be called up only when it would be impossible to comfort the relatives with the impotence to designate the true nature of the disease, or to quickly calm the laity."

BILLARD, who was a careful student of pathological anatomy, particularly with reference to infancy, found nothing to impress him with the importance of dentition.

As we look over the list of symptoms given by HUNTER we find that many of them can be explained much more rationally by the results of modern positive observation. Diarrhœa has been shown to be intimately connected with fermentative processes; the respiratory symptoms are those commonly met in rickets, and in cases of pharyngeal adenoids; the convulsions are probably due to rickets; and the enlarged glands are tuberculous.

During the past summer this subject has occupied somewhat the attention of the Academy of Medicine of Paris. At the meeting of July 12, MAGITOT said "We wish that the so-called diseases of dentition, might be definitely erased from our medical nosology."

This brought a reply from M. PAMARD on August 9, who took the following ground:

1. All difficult dentition is accompanied by a disturbance of the health of the infant.

2. In cold climates, and in cold seasons, all difficult dentition is accompanied by reflex phenomena on the part of the respiratory organs. In warm climates and in warm seasons, all difficult dentition is ascompanied by reflex phenomena on the part of the digestive organs.

3. The diseases allied to dentition in the infant, pursue a course, and present characteristics, which are clearly defined and well established.

These propositions were supported only by the old argument of coincidence, but the essayist was upheld by MM. LE ROY DE MERICOURT, HERARD, CHARPENTIER, PETER, and CONSTANTIN PAUL. He was opposed by MM. OLLIVIER, and HARDY.

In the study of this question, it is first necessary to separate dentition and gum-lancing. The first is a possible pathological condition, while the second is a therapeutic procedure.

We think it can be said without fear of contradiction, that there is not a single positive observation which has ever been recorded to prove that dentition produces general or reflex symptoms. It is undeniable that at the period in life when dentition is in progress, the infant is subject to certain disorders which occur much more commonly than at any other period of life.

If it could be shown that dentition was the only peculiarity of the infant, then its causative influence would be clear. But dentition is not the only peculiarity of the infant, and co-existing phenomena can only be classed as coincident. The most profound characteristic of infancy is that it is the period of most rapid growth and development of all organs; and careful observation of infants reveals numerous and great deviations from the normal growth and development in many instances. It will probably not be denied that such deviations are found most commonly in infants who have been artificially fed. In infants improperly fed, and this term is too extensive to attempt to define here, reflex manifestations are very readily produced, and it is not improbable that even a normally developing tooth may, in such an infant, be the exciting cause of trouble. We have seen infants, who would invariably have a bronchial attack immediately before the proruption of a tooth, but they have invariably been infants who were suffering from demonstrable deviations from normal nutrition. We have further found that after improving the nutrition of these infants, the further progress of dentition was unaccompanied by symptoms.

In such cases while it would be just as well perhaps to recognize the possible influence of dentition, its subordinate importance should be kept clearly in view. The great danger of teething is in the diagnosis, for when this is once made, the important underlying conditions are apt to be neglected, and permitted to progress to the death of the child.

Dentition is a convenient scape goat, and OLLIVIER has well said in the discussion just referred to: "During the nearly ten years that I have been connected with the Hospital for Sick Children, it has often happened that children brought to me for diseases of this type (teething) have been found to be suffering with an altogether different affection. It is very easy to invoke this diagnosis, but by passing in review the different organs and apparatuses, the diagnosis can easily be rectified."

But if dentition cannot be shown to be the great etiological factor of infantile disorders, it does not follow that gum lancing should be abandoned. It is difficult to overlook the numerous instances in which careful observers have thought they have obtained good results from its use, but it would be well also to bear in mind the many cases in which it has failed. As a therapeutic procedure it may have some value, but the indications for its use must be sought elsewhere than in a supposititious condition of teething. We should like to offer the following conclusions:

1. Before the diagnosis of "teething" is made, there should first be carefully excluded, organic disease of all organs, infection, intoxication, and perversion of nutrition.

2. Gum lancing as a therapeutic measure should stand on its own merits, and be studied apart from any supposititious and undemonstrable process of teething.

DISINFECTION THAT DOES NOT DISINFECT.

The value of any disinfecting process can be estimated only on the basis of experiments with the known germs of a given disease. The random directions which were more or less vaguely followed before KOCH's accurate work, involved not merely an enormous waste of labor and money but gave no guarantee that their object was really obtained, that is to say, that the germs were killed. Since the painstaking researches by KOCH and his pupils, work continued in this country by STERNBERG, PRUDDEN, and others, we known just how to destroy the germs of a given disease in the cheapest and most efficient manner. It is, therefore, a matter for severe censure if vague and inefficient measures are used by parties whose business it is to know what has been done in this line.

The frequent references of the public press to fumigations with sulphur show that many sins are yet committed in the practice of disinfection. No more flagrant instance however, of inefficient disinfection has come to our notice, than the directions issued by the New York Board of Health and reprinted without comment by the *New York Medical Record*.

A sulphate of iron solution in the strength of 1½ parts to 8 of water is advised for the disinfection of cellars, yards, stables, cesspools, sewers and so on. The accurate work above referred to has proven beyond doubt that this substance has feeble disinfecting powers at the best, and is altogether valueless in the manner recommended by the Board.

A zinc solution made by dissolving 4 ozs. of sulphate of zinc and 2 ozs. of salt in 1 gal. of water is directed to be used for disinfecting clothing, bed linen and so on. It has never been shown by any one that this has any disinfecting power whatsoever. In the latter part of the circular it is directed to boil clothing in this solution. While this of course is an efficient measure, what advantage is there in this fluid over pure boiling water? It has been shown that boiling soda solution acts more quickly even than pure water, but no such proof has ever been given of the efficiency of the zinc solution.

Corrosive sublimate solution 1 per 1000 is likewise recommended. But the strong germicide properties of this substance are counter-balanced by its tendency to form precipitates with albumenoids and other organic material and direct experimentation has shown that it is not a reliable agent for the disinfection of discharges. In reference to this as well as to the other substances mentioned in the circular we

fail to find any mention of the importance of time in the process of disinfection. No one not fully familiar with disinfection methods could obtain reliable results by following the loose directions given.

The circular ends with a totally unjust praise of sulphur fumigation. Over and again it has been shown that sulphurous acid is not at all germicidal when dry and that even when moist it permeates larger articles very imperfectly. Under the best conditions attainable on a small scale in the laboratory sulphur fumigations are unreliable, while under the conditions existing in ordinary rooms the concentration of the fumes sinks speedily to such a level that the procedure is totally valueless.

CHOLERA.

The stringent quarantine measures carried into effect at our Nation's ports of entry, have been signally successful thus far in preventing the introduction or development of a single case of cholera in this country. This is a magnificent triumph for State medicine and sanitary science.

Unfortunately, there has been a considerable amount of friction between the National, State and local authorities, as to the powers of each in the enforcement and regulation of quarantine measures, clearly demonstrating the vital necessity for a Cabinet Officer of Public Health, whose rulings should have all the force and effect of enacted law.

Medical science has so far perfected our knowledge of the habits of the present threatening invader, as to enable the quarantine officers to hold the disease at bay. This has been done with such imperfect regulations as to involve very great hardship, sickness and death to many hundreds of people in the quarantined vessels. While these regulations are apparently justifiable, a single head with unquestioned power and authority, would be able to do all that is necessary, and with a show of mercy to the unfortunate passengers on quarantined vessels.

* * * * * *

Hamburg vessel owners cannot be too strongly condemned for sending their infected ships carrying thousands of passengers to our shores. The captains of these vessels seem to have never thought of the propriety of turning about, and carrying back their loads of living freight to the harbors from whence they sailed. If there are no laws for the penal punishment of such ship captains, such laws should be enacted as speedily as possible.

* * * * * *

The enactment by Congress, of stringent immigration laws, to limit, if not to effectually stop the use of American ports as a common dump for the use of the other nations of the earth will meet with universal approval.

We concede the ability of the American people to absorb, assimilate and utilize nearly everything that comes to them, but the line must be drawn, and this is a good time to do so. Let it be made so strong and plain that every Hamburg or other ship owner can understand it, and that without an interpreter.

EDITORIAL NOTES.

Errata.—On page 285, 17th line from top of first column the word *anterior* should be *interior* and 36th line from top of same column *ten* instead of *two* years.

Canadian Medical Association.—We have received from Dr. Herbert S. Birkett, secretary of the Canadian Association, an invitation to attend the twenty-fifth annual meeting at Ottawa. There will be a three-day session, on September 21 to 23, under the presidency of Dr. John L. Bray of Chatham. Dr. Donald Maclean of Detroit, has been invited to deliver the address in surgery. The address in medicine will be given by Dr. Graham, of Toronto. The customary arrangements with railway officials have been made, as shown by the following, taken from the members' notification: "Arrangements have been made with the Grand Trunk and Canadian Pacific Railways whereby members and delegates may obtain return tickets for one fare and one-third. Members and delegates will please bear in mind certificates entitling them to reduced rates *are to be obtained from the station agent at the place of departure*; one full fare is to be paid, and upon presentation of the certificate on the return journey, a ticket will be issued at one third of full fare."

The Re-vaccination of Soldiers.—In 1890, not one case of small pox was reported to have occurred in the British Army. This is evidence of the protection of re-vaccination against a malady once so fatal to armies, and still very disastrous where the measure is inefficiently carried out. Even in the armies and navies of Europe wherein the rules of re-vaccination have been administered vigorously mortality by small-pox has not been wholly eluded. The British Navy especially has found it a difficult matter to exclude mortality from this cause. The Prussian army has an enviable record in this regard, being able to show not more than 100 cases by death, from this cause, in a period of forty years.

Salophen in Rheumatism.—Dr. William H. Flint, of New York City, has had an opportunity to try this remedy at the Presbyterian Hospital, following out the suggestion of Dr. Guttmann of Berlin, made in 1891. The cases were chiefly acute attacks. The drug was administered in fifteen grain doses, put dry upon the tongue, and followed by a swallow of cool water, every three hours; and with sodium bicarbonate in ten grain doses thrice daily. Dr. Flint's report of the treatment may be found in the *New York Medical Journal* for July 30. There was a reduction of *dolor*, *rubor* and *calor* in five out of six cases on the second or third day of the treatment. In the view of the author, the dosage might properly have been larger and prompter relief obtained, but he was desirous of moving in a conservative manner. The heart's action was not weakened nor the stomach upset in any of these cases. There was no distinct effect upon the urinary excretion. No relapses and no cardiac nor pleuritic intercurrences were observed. From these facts the author believes that salophen ranks highly, along with other salicylates, as a potent medicine for acute rheumatism, and has this advantage, over some of the other drugs, that the new treatment does not enfeeble the heart, disturb the stomach nor produce smoky and albuminous urine. Judging from the experience of Dr. Flint the rheumatic pyrexia

may be expected to fall to very nearly the normal within twenty-four to thirty-six hours after the first administration. If this experience finds confirmation in trials that are about to be made by the writer and others, the treatment will undoubtedly be "pushed" with the view of bringing down the "febrile movement" even earlier than has yet been done. The remedy appears to be among the safest of the new synthetic preparations.

A NEW DISINFECTED CHIRURGICAL LEATHER OR ARTIFICIAL CHAMOIS.—A very learned German chemist and naturalist has invented a new process of mineral tanning by which a beautiful chamois leather is made from sheep skins. It is tanned with a substance absolutely harmless and not decomposed nor injured by washing in soap suds. It can be soaked with any disinfectant without harm to the quality of the leather. It is claimed that bacterial life and fungoid growths are not produced by long contact of this leather with the human body surface. Very desirable for bandages, artificial limbs, harnesses, eczema, etc. In oil and alum tanned leathers the animal fiber is still liable to decomposition. The oil or alum can be removed by washing or by extraction while the fiber remains in a more or less crude and decomposed or decomposable condition. Ordinary surgical leathers kept in contact with the body of the sick, prove to be nests of bacteria. This leather does not as, 1, The animal fiber is in a neutralized condition or combination with the tanning material and cannot be extracted: 2, The tanning material combined with the fiber, being neither decomposable nor alterable at all, produces one of the most stable compounds known; 3, The tanning material is widely diffused in Nature, is one of the essential elements of animal life and not noxious like decomposed and decomposing oil or alum. The samples can hardly be distinguished from chamois. Finer sorts are produced from goat and deer skins.

DOMESTIC CORRESPONDENCE.

To the Editor of the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION:

I desire to call the attention of those who have served as Acting Asst. Surgeons U. S. Army either during or since the War of the Rebellion, to the fact that an Asssociation of Acting Asst. Surgeons U. S. Army was organized in 1868. All past and present Acting Asst. Surgeons are cordially invited to become members, and the addresses of those resident in Chicago, Milwaukee and Cincinnati are especially desired. Circulars can be obtained by addressing the undersigned. Very truly yours,

W. THORNTON PARKER, M.D.,
Recorder Assoc. Acting Asst. Surgeons.

2220 Wabash Ave., Chicago, Sept. 13, 1892.

SELECTIONS.

A BOOM IN LYSOL.—The chief Sanitary Board of Austria has published, apropos of cholera, a statement regarding the value of some new disinfectants, in which it draws special attention to lysol. It says that the drug is speedily destructive to the comma bacillus, but is much less poisonous to man than is carbolic acid. A further advantage which lysol possesses over carbolic acid as a disinfectant of the hands, linen, etc., is that a solution of it renders the skin smooth instead of rough.—*Medical Record.*

CONTAGION THROUGH FLIES.—If, as it appears to have been proven by experiment, flies may be the means of disseminating anthrax. tuberculosis and other infectious diseases, they should be objects of especial suspicion during an epidemic of cholera. They should be excluded from the house as far as possible, and all articles of food and drink should be protected by screens from contamination by them.—*N. Y. Med. Record.*

A CORYZA SNUFF is thus formulated in the French journal *L'Union Medicale*: Naphthalin,in an impalbable powder ʒ vi.; powdered boracic acid, ʒ vj.; powdered camphor, gr. xv.; extract of violets, gr. xv.; essence of roses, gtt. xx. Sig. Mix, and use as a snuff in coryza.

MISCELLANY.

AMERICAN RHINOLOGICAL ASSOCIATION.—Programme of exercises of the ninth annual meeting of the American Rhinological Association, to be held at The Denison, Indianapolis, Ind., September 20 and 21, 1892. The profession is cordially invited to attend the meetings of the Association.

1. Reading of Minutes of Council Meeting; 2. Report of Secretary and Treasurer; 3. Report of Librarian; 4. Reports of Committees; 5. Examination of Theses of Applicants for Fellowship; 6. Balloting for Candidates; 7. Miscellaneous Business.

1. Address of Welcome, E. R. Lewis, M.D.
2. President's Address, R. S. Knode, M.D.
3. Papers from Corresponding Members and Letters from Absent Fellows.
4. Arranging for Future Meeting.
5. Social Discussion in Refreshment Room.
6. Paper: Nasal Stenosis and Surgical Treatment, John North, M.D., Toledo, O.
7. Paper: The Uses and Abuses of Cocaine, with reference to the Mucous Membranes only, A. G. Hobbs, M.D., Atlanta, Ga.
8. Paper: What is the best Diphtheritic Solvent? T. Hunt Stucky, M.D., Louisville, Ky.
9. Paper: The Faucial, Lingual and Pharyngeal Tonsils, W. R. Cheatham, M.D., Louisville, Ky.
10. Paper: Acid Eustachian Discharges as a Cause of Inflammation of Air Passages and of Obstinate Cough, R. S. Knode, M.D., Omaha, Neb.
11. Paper: Diseases of the Middle Turbinates, A. B. Thrasher, M.D., Cincinnati, O.
12. Paper: Nasal Hypertrophies, D. Emmett Welsh, M.D., Grand Rapids, Mich.
13. Paper: Neuroses of Nasal Origin, W. H. Neilson, M.D., Milwaukee, Wis.
14. Paper: Relation of Diseases of the Upper Air Passages to the Genital Organs, J. G. Carpenter, M.D., Stanford, Ky.
15. Paper: Title not given, C. F. McGahan, M.D., Aiken, S. C.
16. Paper: Diseases of the Antrum of Highmore, L. C. Cline, M.D., Indianapolis, Ind.
17. Paper: Title not given, A. De Vilbiss, M.D., Toledo, O.
18. Paper: Title not given, C. von Klein, M.D., Cleveland, O.
19. Social discussion in the refreshment room.

OFFICIAL LIST OF CHANGES in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from August 27, 1892, to September 9, 1892.

Capt. George E. Bushnell, Asst. Surgeon U. S. A., is granted leave of absence for one month, to take effect on the arrival of First Lieut. Henry A. Shaw, Asst. Surgeon U. S. A., at Ft. McKinney, Wyo.

Major Peter J. A. Cleary, Surgeon U. S. A., is hereby granted leave of absence for one month.

Capt. William C. Borden, Asst. Surgeon U. S. A., is relieved from further temporary duty at Mount Vernon Bks., Ala., and will return to his proper station, Jackson Bks., La.

OFFICIAL LIST OF CHANGES in the Medical Corps of the U. S. Navy, for the Week Ending September 10, 1892.

Asst. Surgeon James Stoughton, ordered to the "San Francisco."

Asst. Surgeon L. W. Spratling, detached from the "San Francisco," and granted leave for one month.